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Investigating School Mathematics

**Extending
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PUPILS to whom this textbook is issued must not write on any page or mark any part of it in any way; consumable textbooks excepted.

1. Teachers should see that the pupil's name is clearly written in ink in the spaces above in every book issued.
2. The following terms should be used in recording the condition of the book: New; Good; Fair; Poor; Bad.

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In each part below, use the unit shown. First, make an estimate (clever guess) about the number of units needed. Then measure to check your guess.

1. Unit:



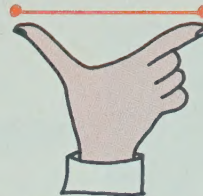
your pace

How far is it across your room?

A Your estimate: _____

B Measured distance: _____

2. Unit:



your thumb-finger opening

How wide is the chalkboard in your classroom?

A Your estimate: _____

B Measured length: _____

3. Unit:



your shoe length

How far is it from your chair to the pencil sharpener?

A Your estimate: _____

B Measured distance: _____

4. Unit:



your hand width

How wide is a desk in your classroom?

A Your estimate: _____

B Measured width: _____

5. Unit:



your thumb width

How long is your book?

A Your estimate: _____

B Measured length: _____

6. Unit:



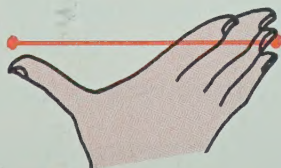
your arm span

How long is your classroom?

A Your estimate: _____

B Measured length: _____

7. Unit:



your span

How wide is a window in your classroom?

A Your estimate: _____

B Measured width: _____

8. Unit:



your little finger width

How far is it from your elbow to your finger tip?

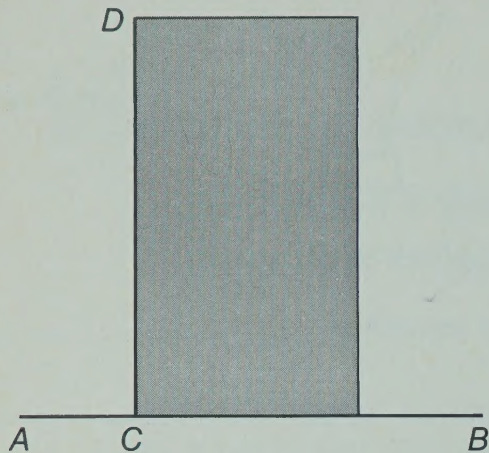
A Your estimate: _____

B Measured distance: _____

● Using a Centimeter Ruler

First circle longer, shorter, or same.
Then measure to find out if you were right.

1.

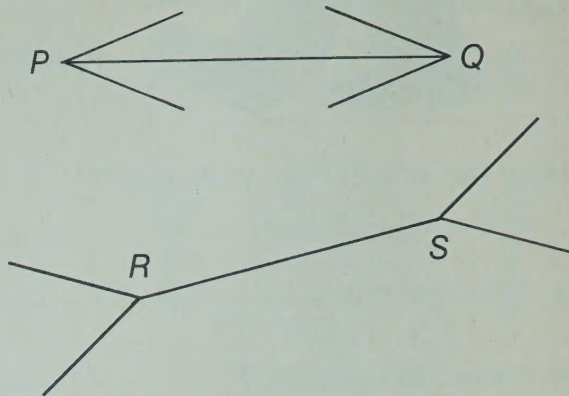


Is segment AB **longer**, **shorter**,
or the **same** as segment CD ?

\overline{AB} is _____ centimeters long.

\overline{CD} is _____ centimeters long.

2.

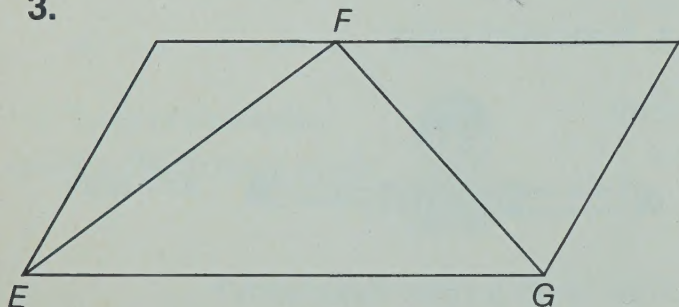


Is segment PQ **longer**, **shorter**,
or the **same** as segment RS ?

\overline{PQ} is _____ centimeters long.

\overline{RS} is _____ centimeters long.

3.

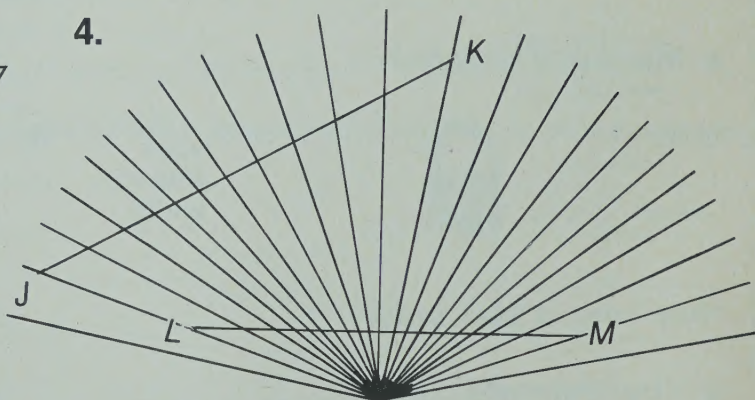


Is segment EF **longer**, **shorter**,
or the **same** as segment FG ?

\overline{EF} is _____ centimeters long.

\overline{FG} is _____ centimeters long.

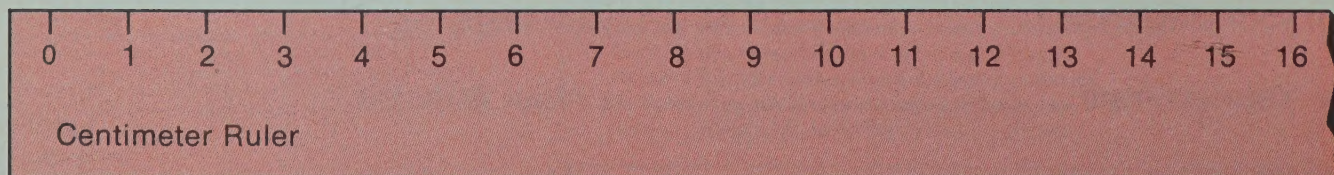
4.



Is segment JK **longer**, **shorter**,
or the **same** as segment LM ?

\overline{JK} is _____ centimeters long.

\overline{LM} is _____ centimeters long.

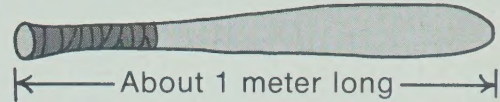


● Units in the Metric System

A **centimeter** unit is about this long.



A **meter** unit is 100 centimeters long.
It is about as long as a large baseball bat.



Estimate the following lengths. Then use a centimeter ruler or a meter stick to check your estimates.

1. Cut a piece of string and put it around your waist.



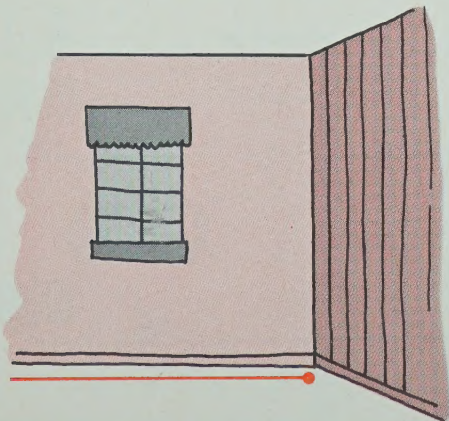
- A** Estimate the distance around
your waist in centimeters. _____
B Measured distance:
_____ centimeters.

2. Cut a piece of string that is exactly your height.



- A** Estimate your height
in centimeters. _____
B Measured height:
_____ centimeters.

3.



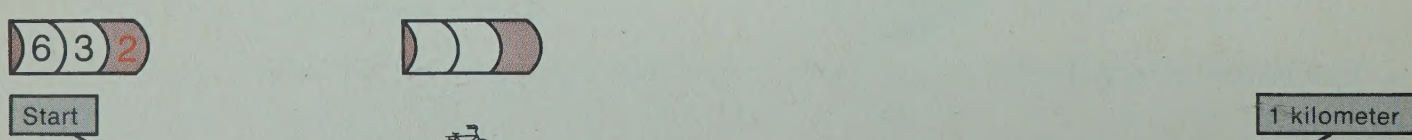
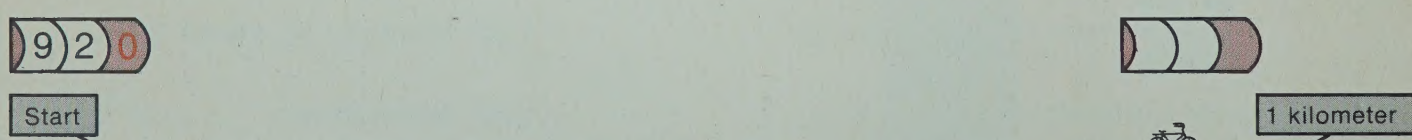
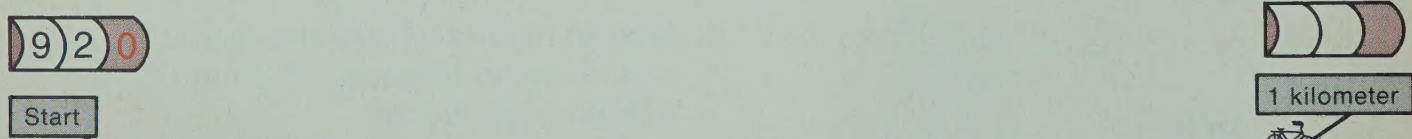
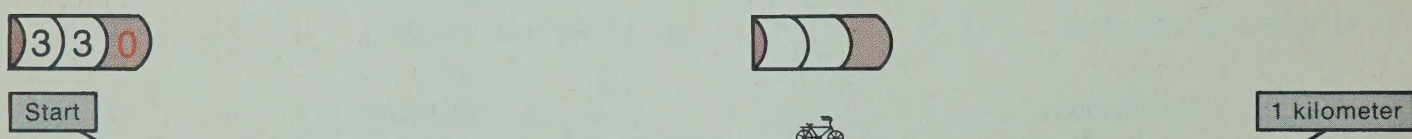
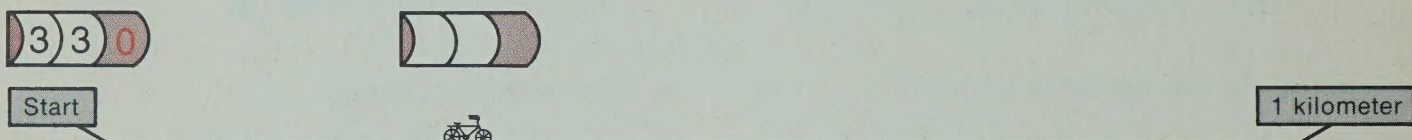
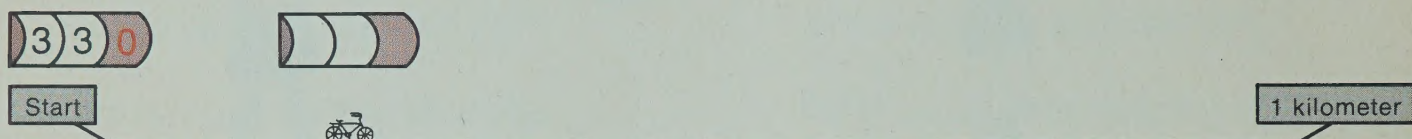
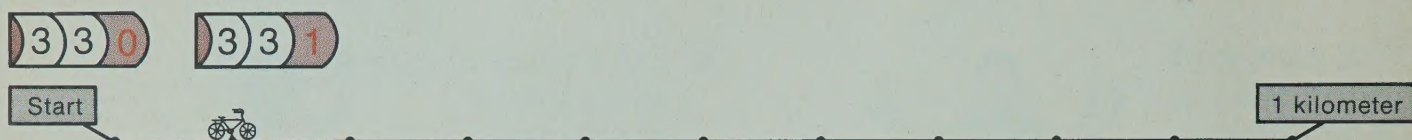
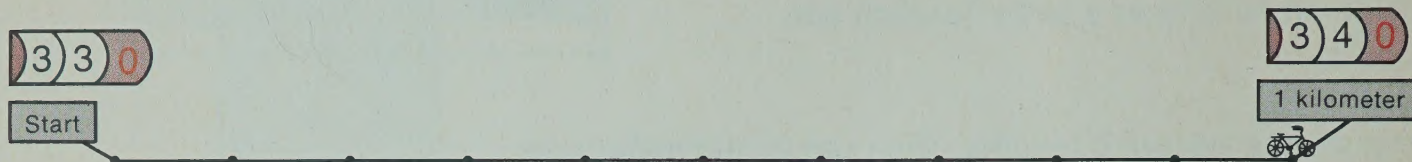
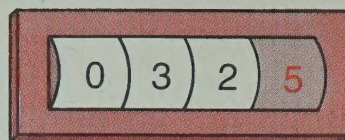
- A** Estimate the length of
your room in meters. _____
B Measured length: _____ meters.

4. Draw a picture of something you would like to measure. Then fill in the blanks below.

- A** Estimate: _____ meters.
B Measurement: _____ meters.

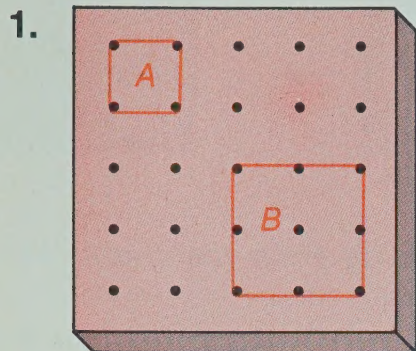
● Using Tenths in Measurement

Eric had an **odometer** on his bicycle.
The red numeral told how many extra tenths of a kilometer he had traveled.
Write the numerals so that each **odometer** shows the correct reading.



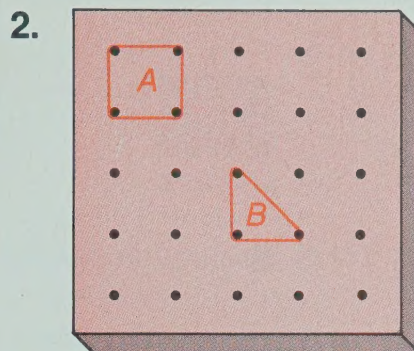
● Area on the Geoboard

Find the area of each figure. The area of this figure is 1 square unit.



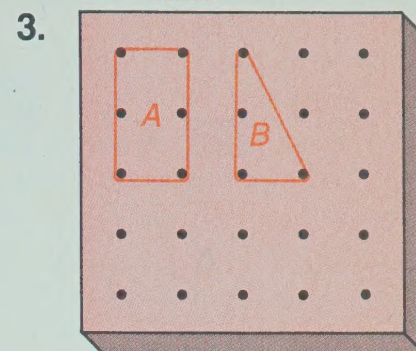
Area A: _____ sq units

Area B: _____ sq units



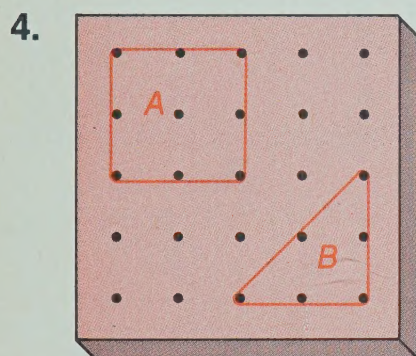
Area A: _____ sq units

Area B: _____ sq units



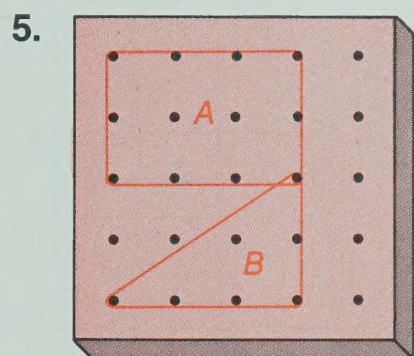
Area A: _____ sq units

Area B: _____ sq units



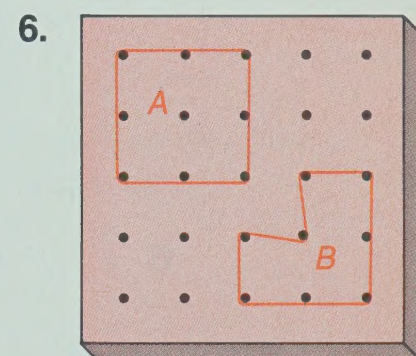
Area A: _____ sq units

Area B: _____ sq units



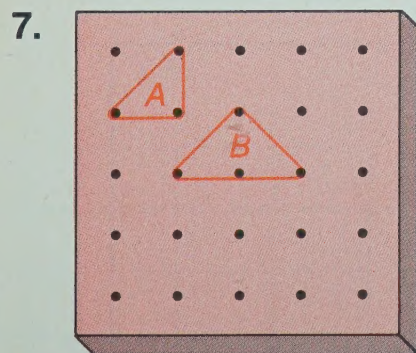
Area A: _____ sq units

Area B: _____ sq units



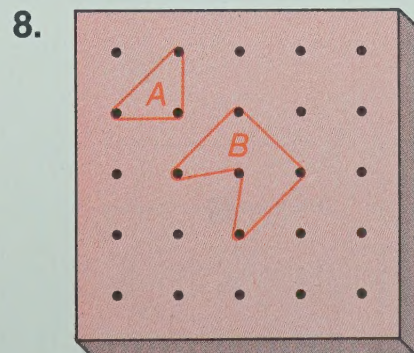
Area A: _____ sq units

Area B: _____ sq units



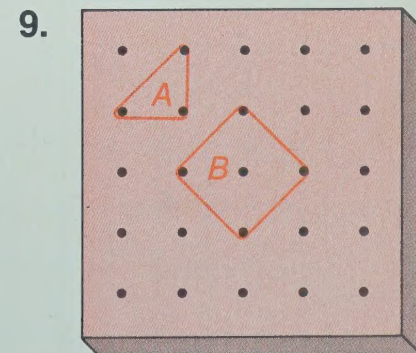
Area A: _____ sq units

Area B: _____ sq units



Area A: _____ sq units

Area B: _____ sq units

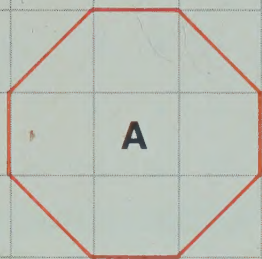


Area A: _____ sq units

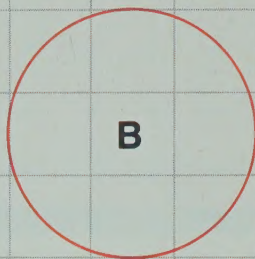
Area B: _____ sq units

● Estimating Area

Find the area of the A figures. You will not be able to find the area of the B figures exactly. Estimate the area of the B figures.

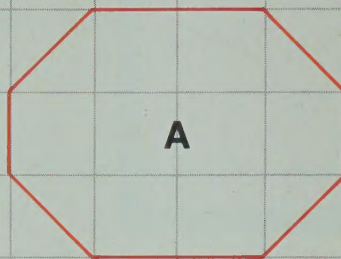


Area: _____ sq units

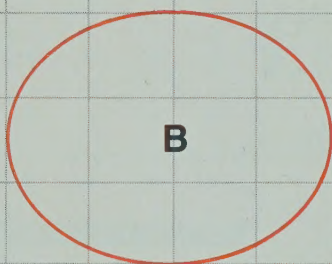


Estimated Area:

_____ sq units

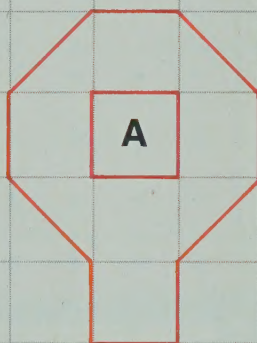


Area: _____ sq units



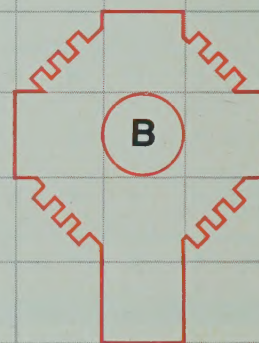
Estimated Area:

_____ sq units



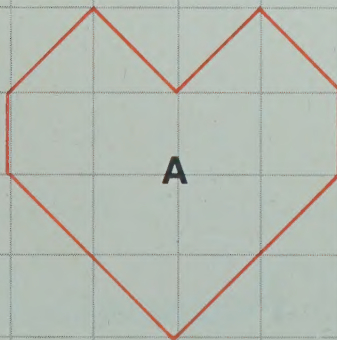
Area:

_____ sq units

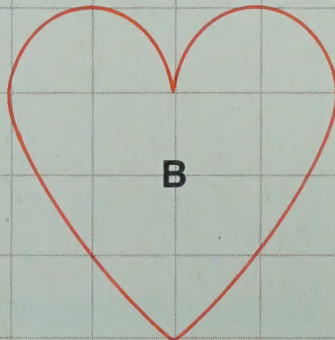


Estimated Area:

_____ sq units

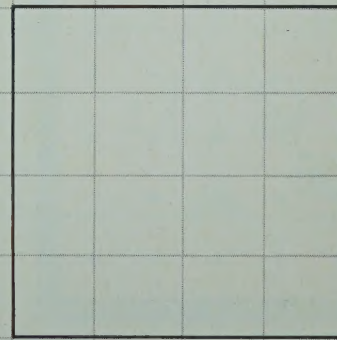


Area: _____ sq units



Estimated Area:

_____ sq units



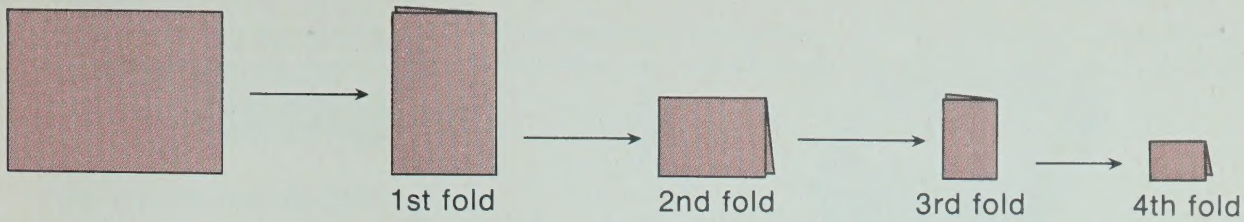
Draw your own.

Estimated Area:

_____ sq units

● Fractions in Measurement

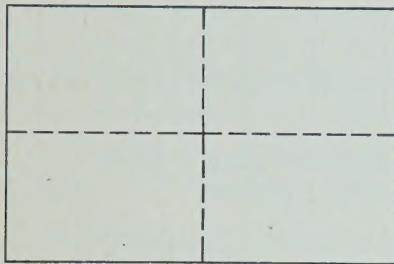
Fold a paper in half 4 times.



Guess how many parts you will see when you unfold the paper. _____

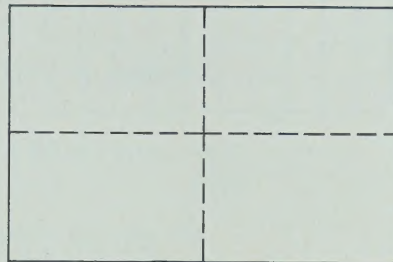
Now unfold the paper. How many parts do you see? _____

Color enough parts to show the fraction.



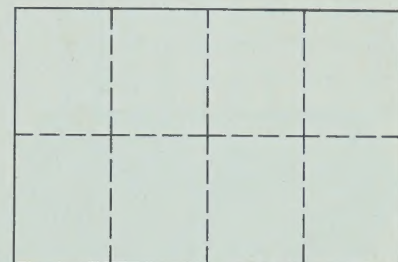
1 of 4 parts

$$\frac{1}{4}$$



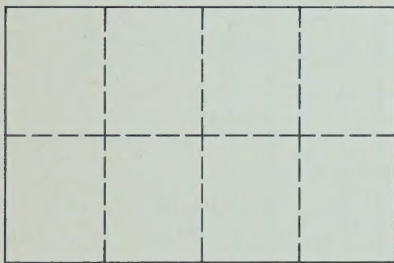
3 of 4 parts

$$\frac{3}{4}$$



3 of 8 parts

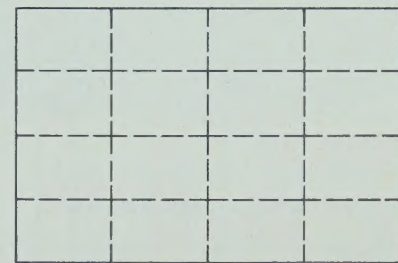
$$\frac{3}{8}$$



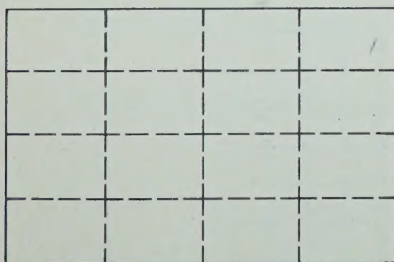
$$\frac{1}{8}$$



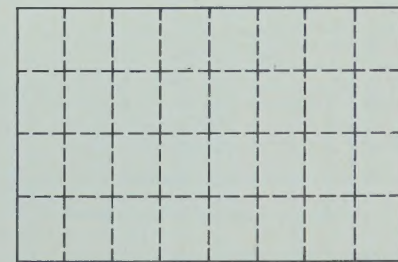
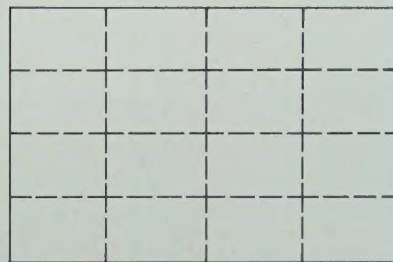
$$\frac{1}{16}$$



$$\frac{8}{16}$$



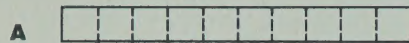
$$\frac{15}{16}$$



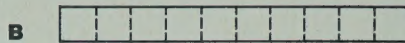
You choose the fraction and color the parts.

● Exploring Tenths and Hundredths

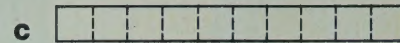
1. Color enough parts to show the fractions.



$$\frac{1}{10}$$

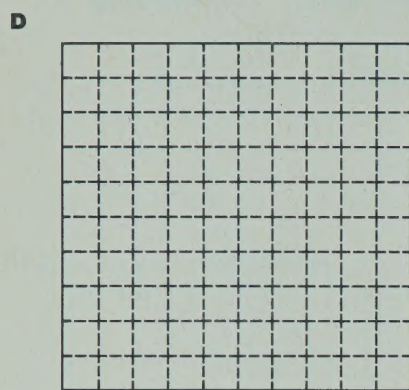


$$\frac{5}{10}$$

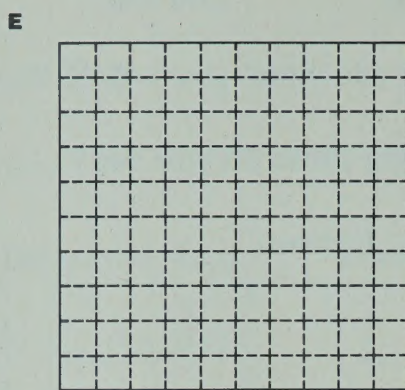


Choose your own fraction.

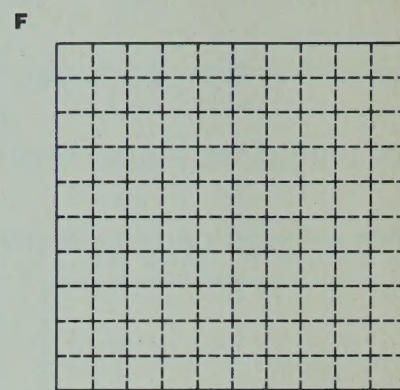
$$\frac{1}{10}$$



$$\frac{10}{100}$$



$$\frac{75}{100}$$

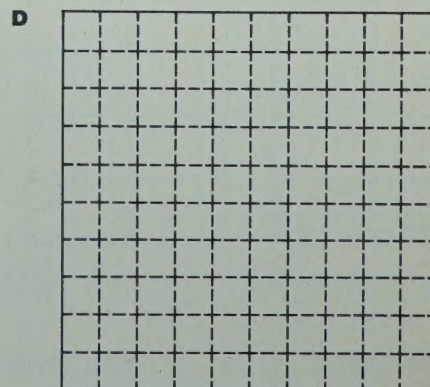
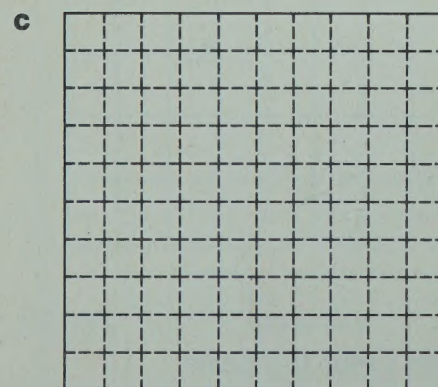
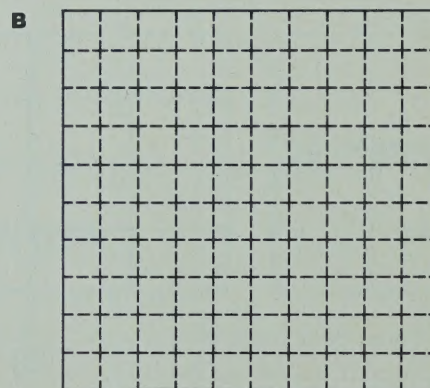
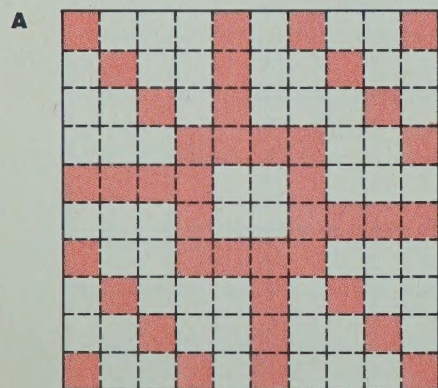


Choose your own fraction.

$$\frac{1}{100}$$

2. Color an interesting design. Then give the fraction (using tenths or hundredths) that shows what part is colored.

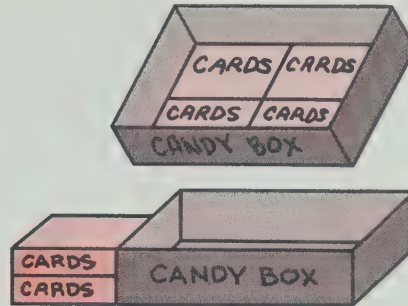
EXAMPLE: $\frac{40}{100}$



● Some Box Problems

1. Four card boxes cover the bottom of this candy box. The card boxes can be stacked two deep. How many card boxes will

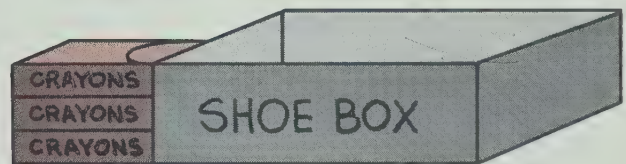
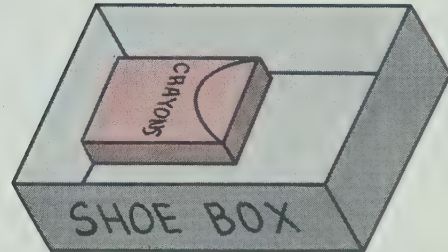
the candy box hold? _____



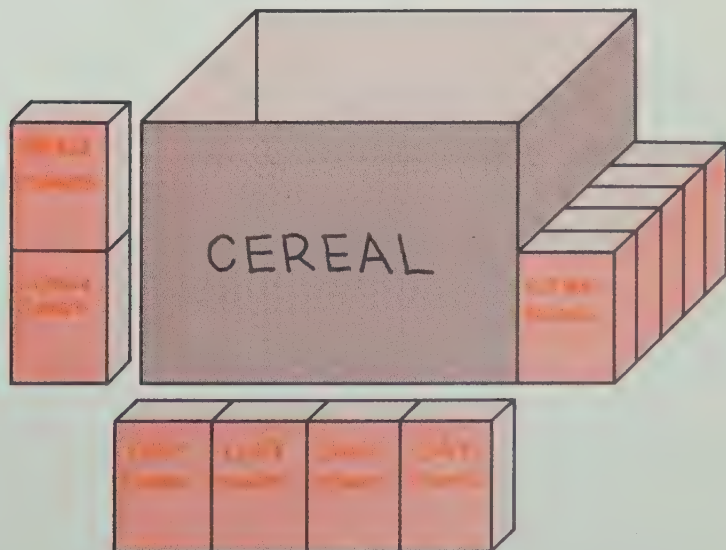
2. **A** How many crayon boxes are needed to fill the bottom of the shoe box? _____

- B** How deep can the crayon boxes be stacked? _____

- C** How many boxes of crayons can be put into the shoe box? _____



3. How many small cereal boxes will the large cereal box hold? _____



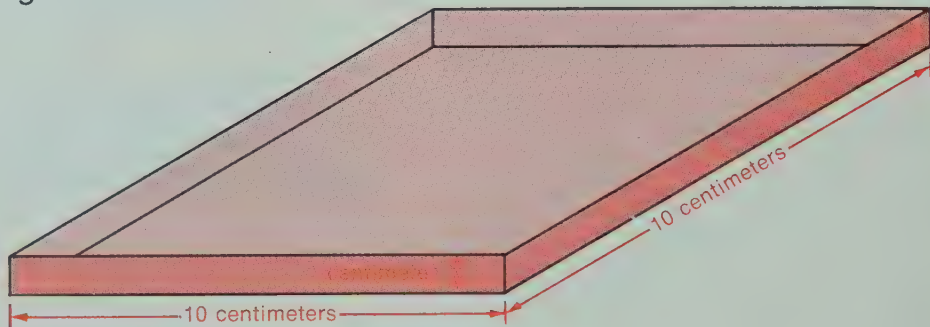
● How Much Will It Hold?

A cube-shaped container with each edge as long as the 10-centimeter strip holds 1 liter of liquid.

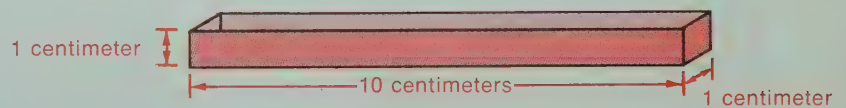


Complete the following:

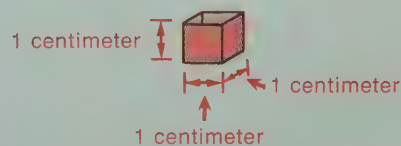
1. How many of this container full of water would it take to fill the liter?



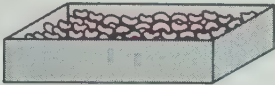


2. How many of this container full of water would it take to fill the liter? _____



3. How many of this container full of water would it take to fill the liter? _____



Can you find 3 ways to group the beans using beansticks and boxes. Use the **fewest** number of “containers” in one row. Mark a ✓ beside this row.

Amount		Boxes (100 beans) 	Beansticks (10 beans) 	Beans 
1. 236 beans (two hundred thirty-six)	A	3	13	6
	B			
	C			
2. 341 beans (three hundred forty-one)	A			
	B			
	C			
3. 184 beans (one hundred eighty-four)	A			
	B			
	C			
4. 752 beans (seven hundred fifty-two)	A			
	B			
	C			
5. 913 beans (nine hundred thirteen)	A			
	B			
	C			

● Estimating One Hundred

Estimate each of the following. Use the code at the bottom of the page to check your estimate. Then "grade" your estimate.

1. One hundred drops of water would

fill what part of a glass? _____

My estimate was

very close _____ not too far off _____ far off _____

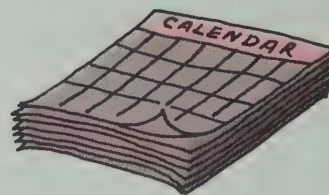


2. One hundred days is about

how many weeks? _____

My estimate was

very close _____ not too far off _____ far off _____



3. How many centimeters tall is

a stack of 100 checkers? _____

My estimate was

very close _____ not too far off _____ far off _____



4. A stack of 100 pennies is as tall

as how many pennies stacked on edge? _____

My estimate was

very close _____ not too far off _____ far off _____

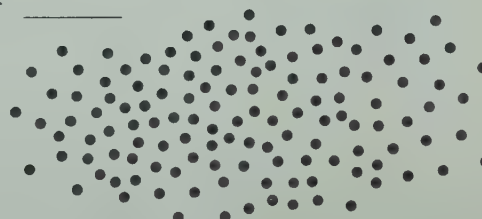


5. Circle your estimate of 100 dots.

Count to check your estimate.

My estimate was

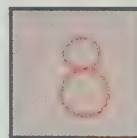
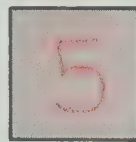
very close _____ not too far off _____ far off _____



Code: P = 1 R = 2 T = 3 V = 4 X = 5 Z = 6 B = 7 D = 8 F = 9 H = 0
1. $\frac{V}{P}$ 2. PV 3. ZH 4. D

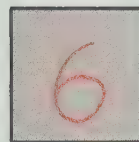
● Three-Digit Numerals

1. Think of all the 3-digit numerals using these digits. List them in order from smallest to largest.





smallest 335 _____ largest

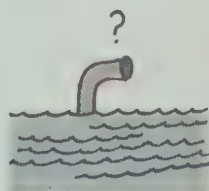
2. Think of all the 1, 2, and 3 digit numerals using these three digits. List them in order from smallest to largest.



smallest _____ 9 _____
 _____ 92 _____
296 _____ largest

3. I am the smallest 3-digit number with all digits different and even.
 What number am I? 
- _____

4. I am the largest 3-digit number with all digits different and odd.
 What number am I? 
- _____

5. I am the smallest 3-digit number with all digits alike.
 What number am I? 
- _____

● Estimating 1000

Can you circle the best estimate for each question?
Check your guess using the code at the bottom of this page.

1. 1000 hours is about ? days.

- A** less than 10 **B** between 40 and 50 **C** more than 100

2. About how many of your classmates on the scales together would weigh 1000 kilograms?

- A** less than 15 **B** between 20 and 60 **C** more than 100

3. A 1000 page book (with pages like your regular math book) would be ? centimeters thick.

- A** about 10 **B** more than 20 **C** about 5

4. How long is 1000 seconds?

- A** about 1 hour **B** about 15 minutes **C** 2 or 3 days

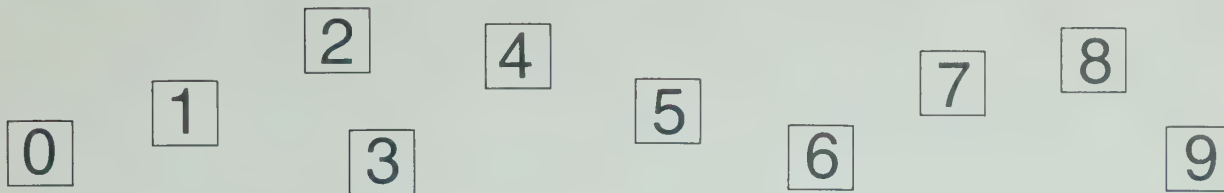
5. How high is a stack of 1000 pennies?

- A** less than 1 meter **B** between 1 and 2 meters **C** more than 2 meters

Code: X = 1 P = 2 J = 3 B = 4 R = 5 D = 6 Z = 7 N = 8 C = 9 K = 0

1. BP 2. About BK 3. B $\frac{P}{X}$ 4. XZ 5. XDK cm.

Digit Riddles – 4-Digit Numbers



1. I am the smallest 4-digit number with all digits alike and even.

What number am I?

2. I am the smallest 4-digit number with all digits even and different. 0 is even and I have a zero.

What number am I?

3. I am the smallest 4-digit number with all digits odd and different.

What number am I?

4. I am the largest 4-digit number with all digits odd and alike.

What number am I?

5. I am the largest 4-digit number with all digits odd and different.

What number am I?

6. I am the largest 4-digit number with all digits different.

What number am I?

7. I am the smallest 4-digit number with all digits different.

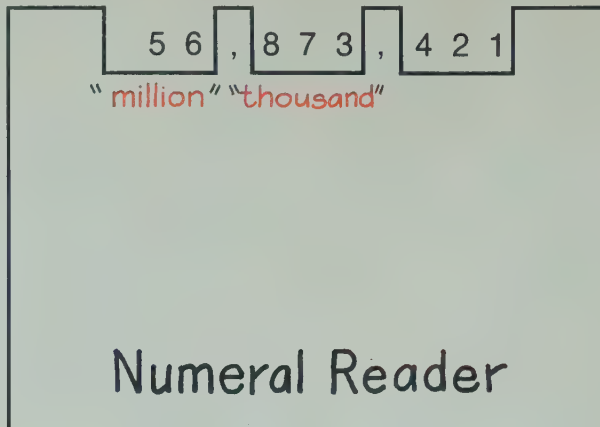
What number am I?

8. I am a 4-digit number. All of my digits are different and their sum is 22.

What number am I?

● Reading and Writing Larger Numbers

Cut out this
numeral reader
and use it to
read and write
numerals in the
exercises below.



Read "fifty-six **million**,
eight hundred seventy-three **thousand**,
four hundred twenty-one."

1. Read these numerals:

- ▲ In a recent year the population of New York City was

1 1 , 4 1 0 , 0 0 0.

- The average distance from earth to the sun is about

1 4 8 , 7 2 9 , 2 0 0 kilometers.



2. Use your "numeral reader" to write these numerals.

- ▲ Average distance to the Moon: Three hundred ninety-two thousand,
one hundred seventy-one kilometers.


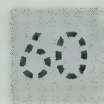

- One of the largest checks ever written:
Three hundred thirty-four million,
eight hundred sixty-seven thousand, eight hundred seven dollars.

- c You choose a large number to write and read.


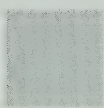

Write 10, 20, 30, 40, 50, 60,
70, 80, 90, or 100




in each . Write another
one of these numbers in each .
Then solve the equation.







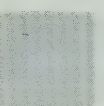

1.  +  = 


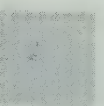

$100 - 60 = 40$




2.  +  = 


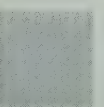

3.  +  = 

4.  +  = 

5.  +  = 

6.  +  = 

7.  +  = 

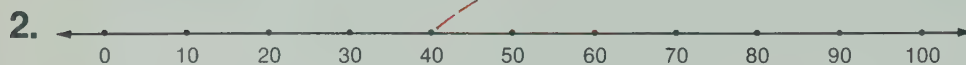
8.  +  = 

Operations on the Number Line

Draw a jump on the number line. Then complete the equation.



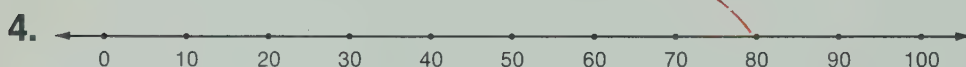
$$2 + \boxed{4} = \boxed{6}$$



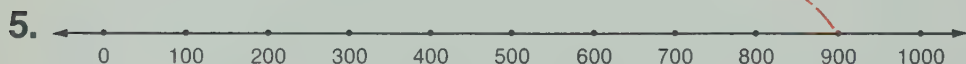
$$40 + \boxed{20} = \boxed{60}$$



$$9 - \boxed{1} = \boxed{8}$$



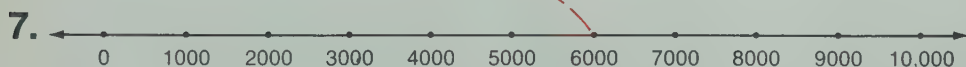
$$80 - \boxed{15} = \boxed{65}$$



$$900 - \boxed{100} = \boxed{800}$$



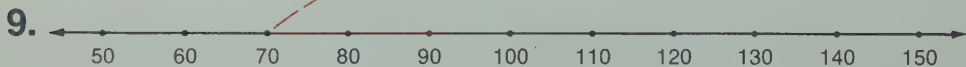
$$3000 + \boxed{1500} = \boxed{4500}$$



$$6000 - \boxed{1000} = \boxed{5000}$$



$$120 - \boxed{15} = \boxed{105}$$



$$70 + \boxed{15} = \boxed{85}$$

● Breaking a Code

Write the correct number in each . Find this number on the "Message Sheet" and write the letter of the problem in the blank above it.

A $9 + 6 =$ 15

J $19 - 9 =$

S $150 - 70 =$

B $+ 7 = 10$

K $13 -$ $= 11$

T $130 - 40 =$

C $8 +$ $= 14$

L $17 -$ $= 9$

U $140 - 80 =$

D $12 - 7 =$

M $- 6 = 10$

V $23 - 5 =$

E $15 - 6 =$

N $- 3 = 8$

W $29 - 10 =$

F $17 - 4 =$

O $- 5 = 7$

X $50 - 20 =$

G $19 - 5 =$

P $- 9 = 8$

Y $100 -$ $= 50$

H $12 -$ $= 8$

Q $30 + 40 =$

Z $26 - 5 =$

I $15 -$ $= 8$

R $80 - 60 =$


MESSAGE SHEET

80 12 16 9 12 11 9 7 80 15

20 9 15 8 8 50 13 7 11 9


17 20 12 3 8 9 16 80 12 8 18 9 20 !


● Exploring Basic Principles

- Fill in each gray square .
- Find 2 "same number" squares and color them the same color.
- Do this until the table is complete. Use as many colors as you can.
- What principle does this show?

+	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3							3 + 6 9			
4										
5										
6				6 + 3 9						
7										
8										
9										

- Find the sums.

A $10 + (5 + 4) =$ 


B $20 + (3 + 2) =$ 

C $40 + (5 + 5) =$ 

$(10 + 5) + 4 =$ 


$(20 + 3) + 2 =$ 


$(40 + 5) + 5 =$ 

$15 + 4 =$ 

$23 + 2 =$ 

$45 + 5 =$ 

D $10 + (5 + 6) =$ 


E $20 + (8 + 7) =$ 


F $50 + (8 + 6) =$ 

$(10 + 5) + 6 =$ 

$(20 + 8) + 7 =$ 

$(50 + 8) + 6 =$ 

$15 + 6 =$ 

$28 + 7 =$ 

$58 + 6 =$ 

- What basic principle could be used to make the work easy in problem 5? _____

Rearranging Addends

1. Find the sums.

A

2	7	
4	3	

B

3	6	
7	4	

C

4	5	
6	3	

D

9	8	
1	2	

E

20	60	
80	10	

F

300	400	
700	600	

2. Find the sums. Look for 10's.

A

7	
6	
3	
4	

B

9
5
1
5

C

8
6
2
3

D

4
6
5
3

E

8
2
6
4
3

F

7
4
3
6
8

G

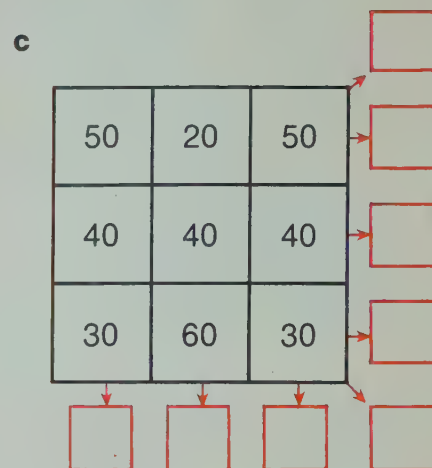
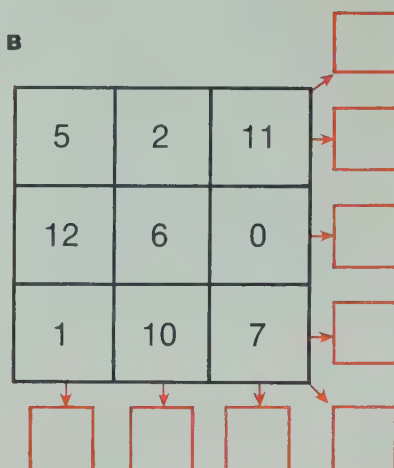
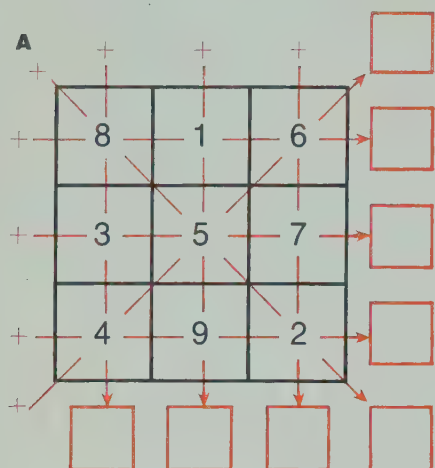
9
4
1
5
6

H

3
2
8
5
2

● Mathematics Magic

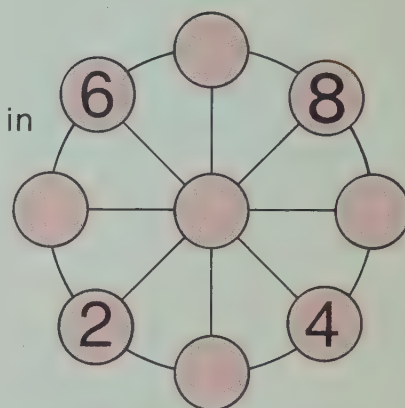
- Find the sum of the numbers in each row, in each column, and along each diagonal of the squares below.



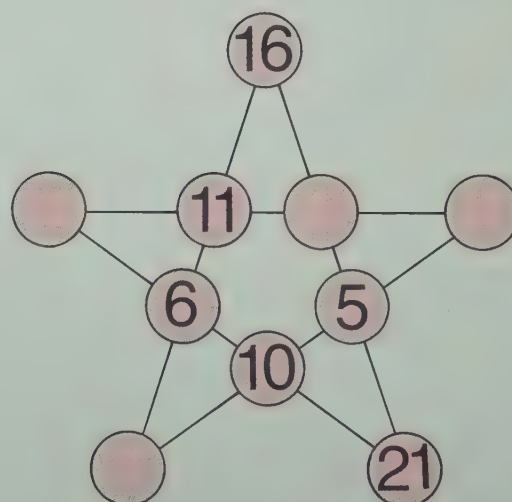
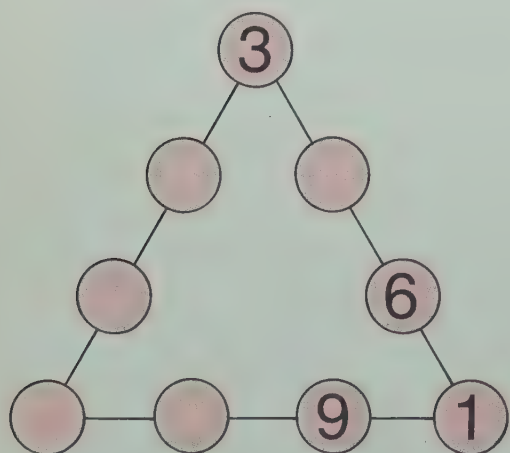
Why do you think these are called MAGIC SQUARES?

4	3	
9		
	7	6

- Make a "magic circle." The sum of 3 numbers in each line across the circle must be 15. Use each of the numbers 1 through 9.



- Complete to make a magic square with "magic sum" 15.



- Make a "magic triangle." The sum of the 4 numbers on each side must equal 17. Use each of the numbers 1 through 9.

- Make a "magic star." Each line of 4 numbers must add to 50.

● Function Machine Fun

Two function machines are connected so that the output of the first machine automatically becomes the input of the 2nd machine. Give the numbers in the table or the missing rule for each exercise.

- 1.**

THE FUNCTION MACHINE

FUNCTION RULE

Add 5

INPUT **OUTPUT**

8

13

→

THE FUNCTION MACHINE

FUNCTION RULE

Add 10

INPUT **OUTPUT**

13

23

	First Input	Final Output
	8	23
A	5	_____
B	50	_____
- 2.**

THE FUNCTION MACHINE

FUNCTION RULE

Double

INPUT **OUTPUT**

4

8

→

THE FUNCTION MACHINE

FUNCTION RULE

Subtract 7

INPUT **OUTPUT**

8

1

	First Input	Final Output
	4	1
A	10	_____
B	50	_____
- 3.**

THE FUNCTION MACHINE

FUNCTION RULE

Add 12

INPUT **OUTPUT**

6

18

→

THE FUNCTION MACHINE

FUNCTION RULE

Subtract 2

INPUT **OUTPUT**

18

16

	First Input	Final Output
	6	16
A	9	_____
B	_____	15
- 4.**

THE FUNCTION MACHINE

FUNCTION RULE

Add 6

INPUT **OUTPUT**

9

15

→

THE FUNCTION MACHINE

FUNCTION RULE

INPUT **OUTPUT**

15

9

	First Input	Final Output
	9	9
	5	5
	3	3
- 5.**

THE FUNCTION MACHINE

FUNCTION RULE

Triple

INPUT **OUTPUT**

2

6

→

THE FUNCTION MACHINE

FUNCTION RULE

Take half

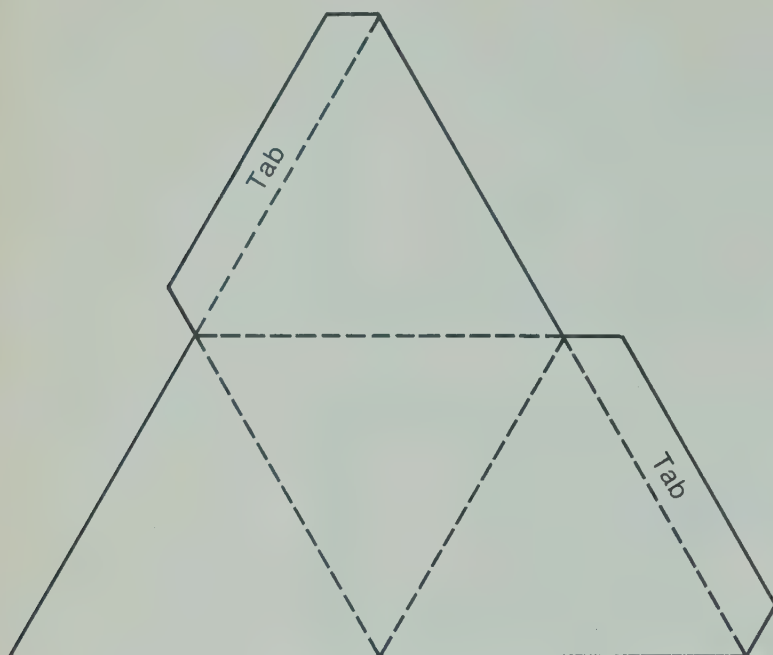
INPUT **OUTPUT**

6

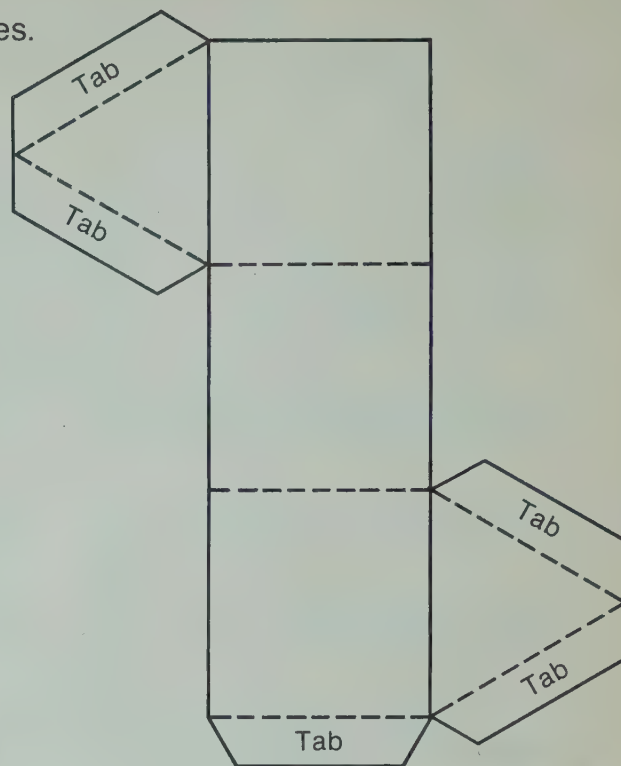
3

	First Input	Final Output
	2	3
A	4	_____
B	6	_____

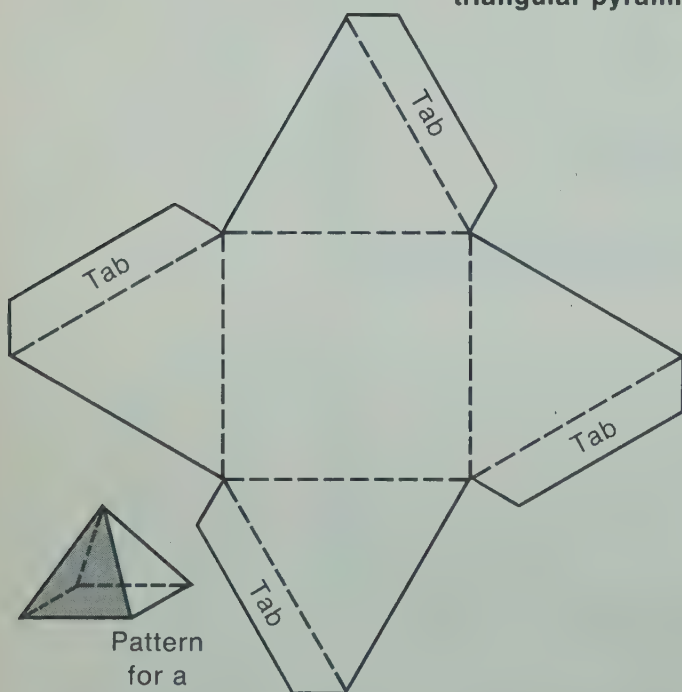
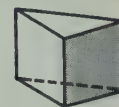
1. Cut out the patterns and make the space figures.
Use them to complete the table.



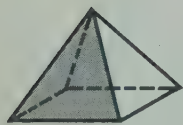
Pattern for a
triangular pyramid



Pattern for a
prism



Pattern
for a
square pyramid



Space Figure	Number of Faces	Number of Vertices	Number of Edges
Cube			
Triangular Pyramid			
Prism			
Square Pyramid			

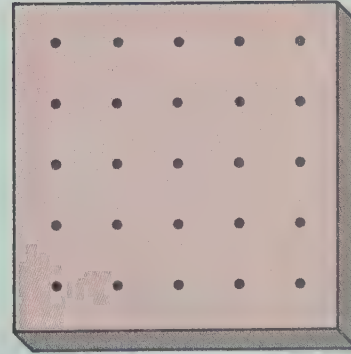
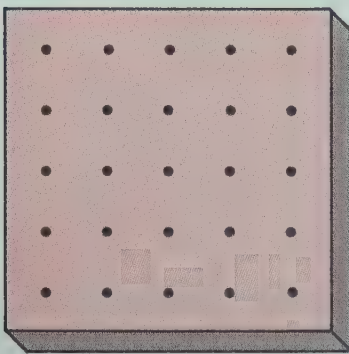
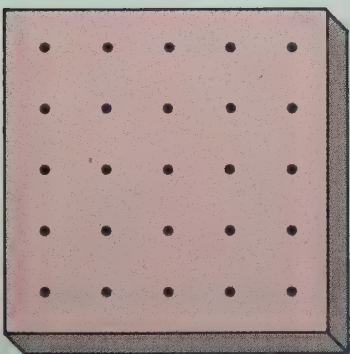
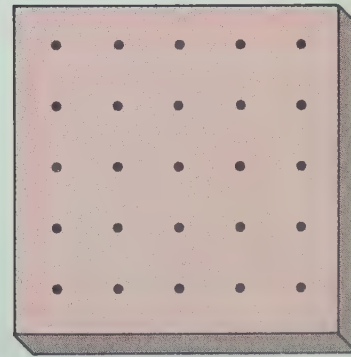
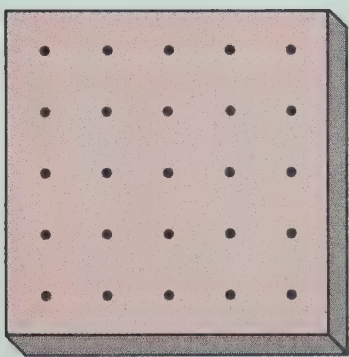
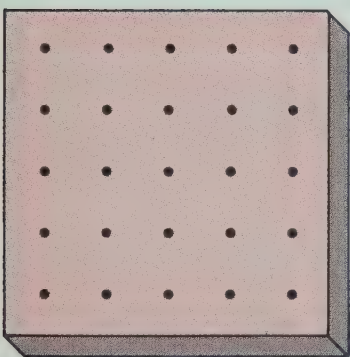
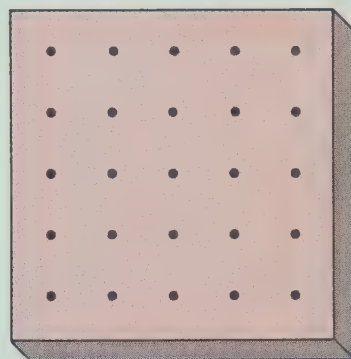
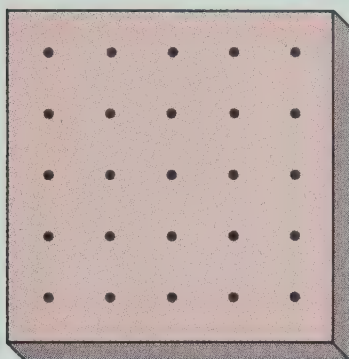
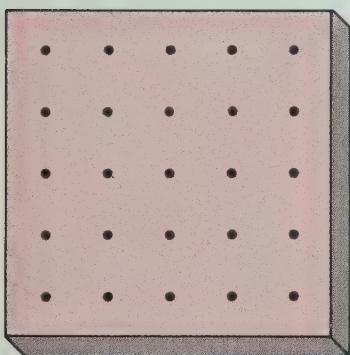
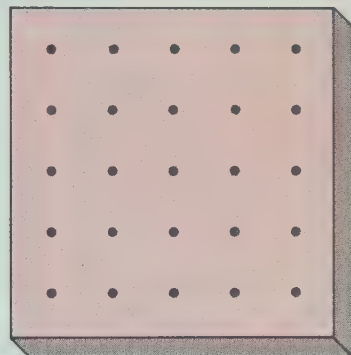
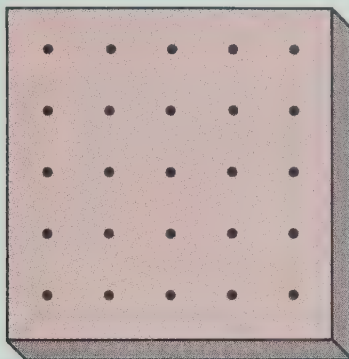
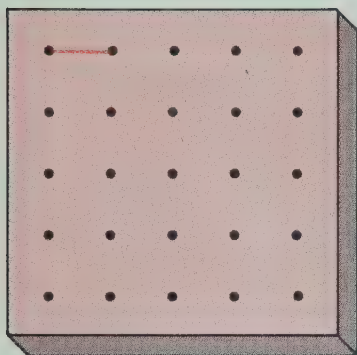
2. Add the number of **faces** and the number of **vertices** for a figure.

How close is the sum to the number of **edges**? _____

Is this true for each figure? _____

● Segments on the Geoboard

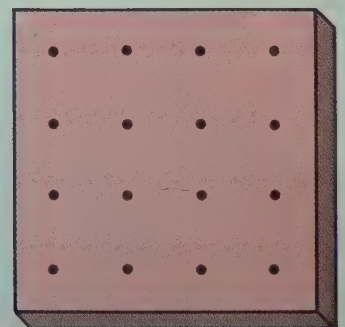
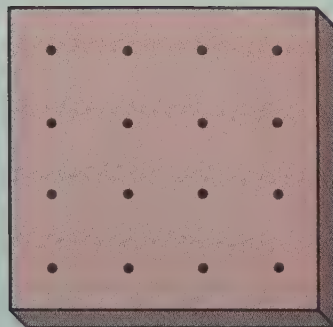
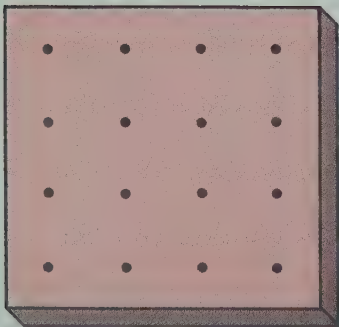
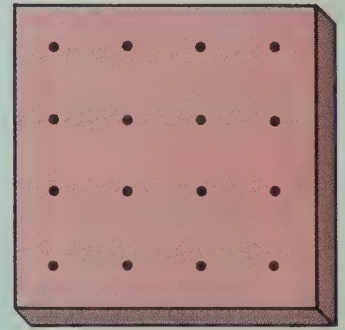
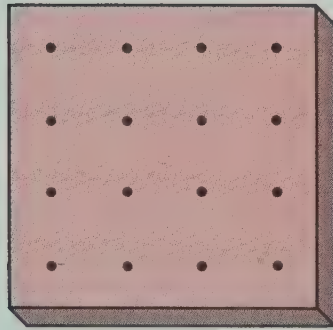
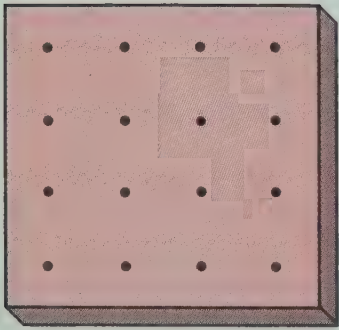
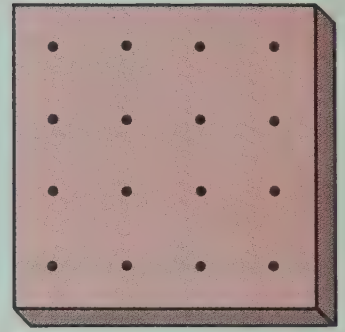
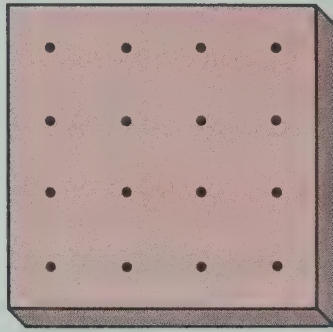
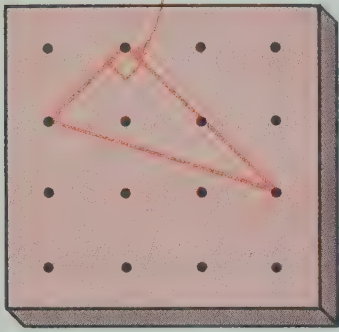
Show a different length segment on each “geoboard.” Use tracing paper to compare the lengths. Then put a “1” beside the longest segment, a “2” beside the next longest, and so on.



● Comparing Triangles

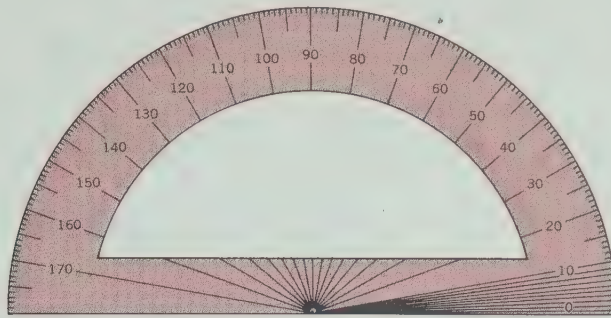
Draw a triangle that has a **right angle** on each geoboard. Each triangle must be different in size or shape. How many can you draw?

right angle

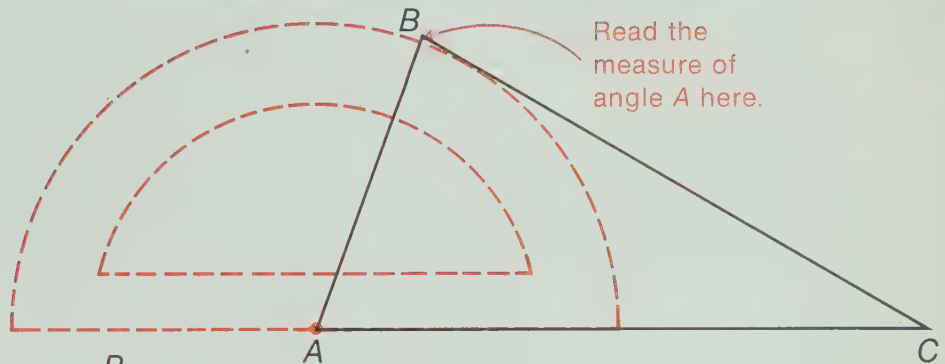


● Measuring Angles

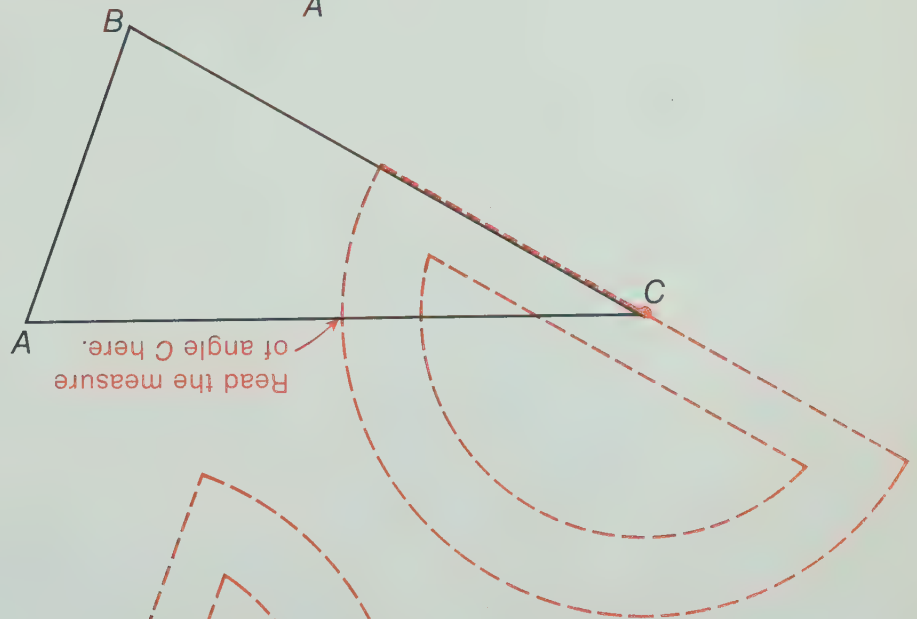
A **protractor** is used to measure angles. Cut out this **protractor** and place it in the dotted outlines to measure the angles of triangle *ABC*



1. The measure of angle *A* is
about _____ degrees.



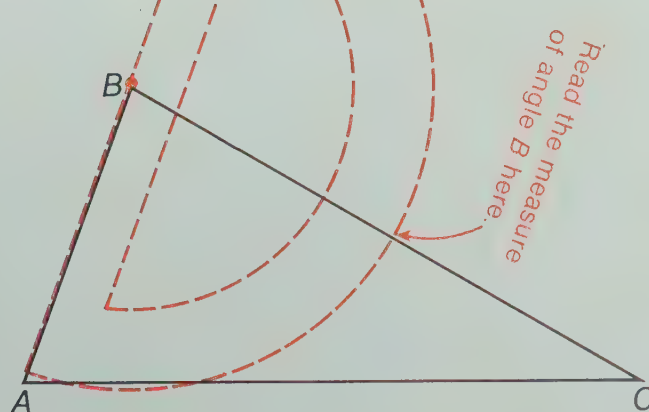
2. The measure of angle *C*
is about _____ degrees.



3. The measure of angle *B*
is about _____ degrees.

4. Is the sum of the
3 angle measures
close to 180 degrees?

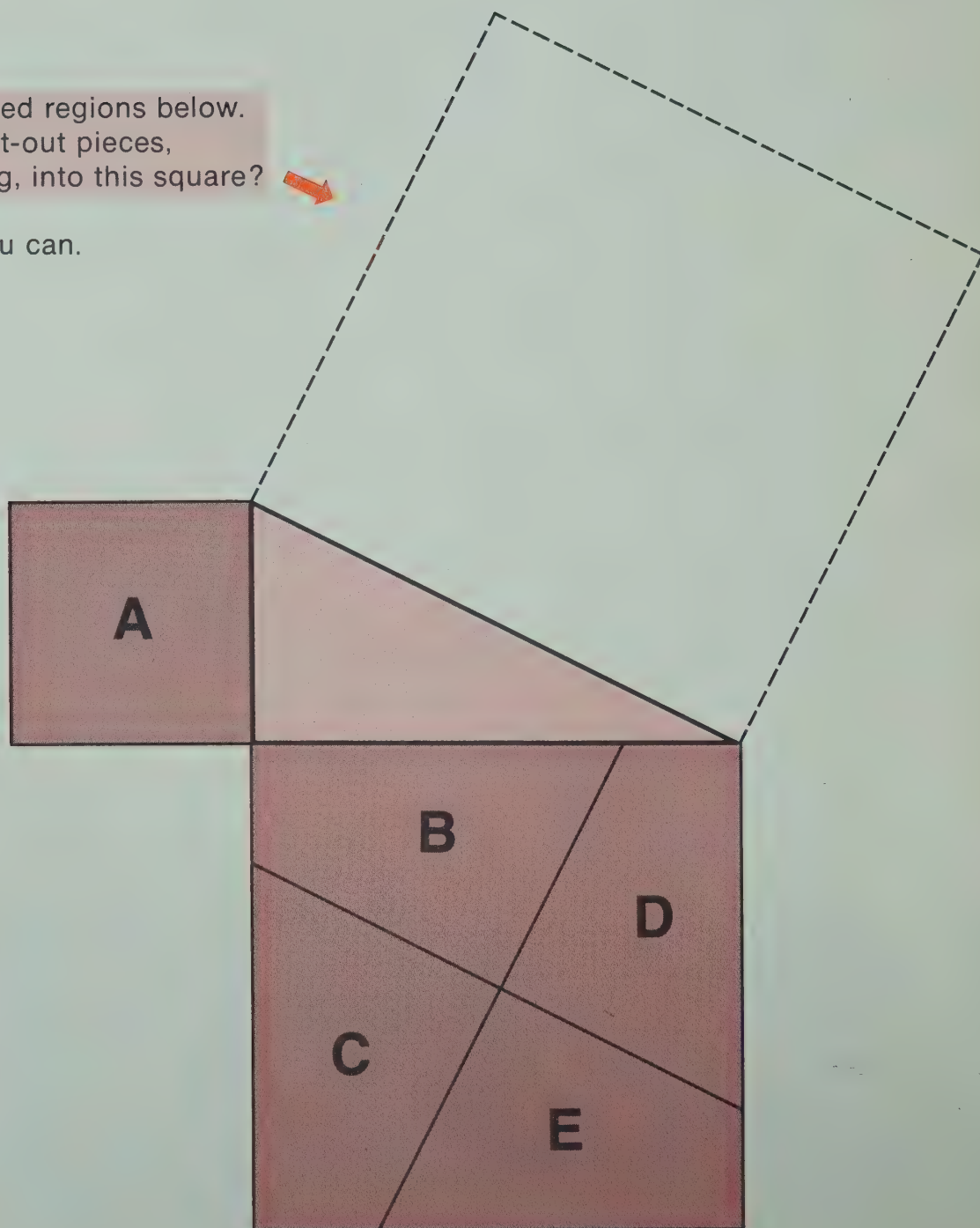
5. Draw another triangle
of your own and find
the measures of its
angles.







● A Right Triangle Puzzle

Cut out the 5 lettered regions below.
Can you fit all 5 cut-out pieces,
with no overlapping, into this square?

Paste them in if you can.



Can you find 3 ways to count out each amount of money. For one of the ways use the **fewest** number of “money pieces.” Mark a ✓ beside the row that shows this way.

Amount		Ten Dollar Bills (1000 pennies) 	Dollars (100 pennies) 	Dime (10 pennies) 	Pennies 
1.	A		2	20	36
	B				
	C				
2.	A				
	B				
	C				
3.	A				
	B				
	C				
4.	A				
	B				
	C				
5.	A				
	B				
	C				

● Adding and Subtracting

1. Find the sums. Look for 100's.

A

$$\begin{array}{r} 60 \\ 90 \\ 40 \\ 70 \\ 10 \\ + 30 \\ \hline \end{array}$$

Three red arrows point from the tens digits (6, 9, 4, 7, 1, 3) to a red cloud containing the number 100, indicating that the sum of the tens is 100.

B

$$\begin{array}{r} 80 \\ 60 \\ 40 \\ 20 \\ 70 \\ + 10 \\ \hline \end{array}$$

C

$$\begin{array}{r} 30 \\ 90 \\ 60 \\ 70 \\ 80 \\ + 40 \\ \hline \end{array}$$

D

$$\begin{array}{r} 50 \\ 30 \\ 30 \\ 50 \\ 40 \\ + 70 \\ \hline \end{array}$$

E

$$\begin{array}{r} 90 \\ 80 \\ 70 \\ 10 \\ 20 \\ + 90 \\ \hline \end{array}$$

2. Write the numeral in each .

A

$$\begin{array}{r} 364 \\ + 53 \\ \hline \end{array}$$

8

B

$$\begin{array}{r} 4 \\ + 921 \\ \hline \end{array}$$

57

C

$$\begin{array}{r} 501 \\ + \\ \hline \end{array}$$

1002

D

$$\begin{array}{r} 985 \\ - 206 \\ \hline \end{array}$$

E

$$\begin{array}{r} 67 \\ - 35 \\ \hline \end{array}$$

54

F

$$\begin{array}{r} 5 \\ - 18 \\ \hline \end{array}$$

251

G

$$\begin{array}{r} \\ - 276 \\ \hline \end{array}$$

200

H

$$\begin{array}{r} 999 \\ + 2 \\ \hline \end{array}$$

130

3. Find the sums and missing numbers.

A

600	50	7	→ 657
200	50	2	→
↓	↓	↓	↓
800			→

B

400	30	9	→
500	40	7	→
↓	↓	↓	↓
			→

● Fun with Sums

The words MOM, BOB, and RADAR remain the same when the letters are written in reverse order. They are called **word palindromes**. Numbers such as 1551, 464, and 81618 remain the same when the digits are written in reverse order. They are called **number palindromes**. Study the example. Try some. Keep going until you arrive at a palindrome.

EXAMPLE:

3 9	←	Start with any number.
+ 9 3	←	Reverse the digits.
<hr/>		
1 3 2	←	Add.
+ 2 3 1	←	Reverse the digits.
<hr/>		
3 6 3	←	The sum is a palindrome!

9 4

8 3

5 9

7 9

1 7 4

7 8

1 8 2

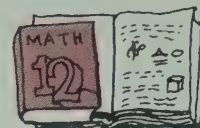
Try some of your own on another sheet of paper.

● Creating Story Problems

Write a story problem for each picture that can be solved using addition or subtraction. Then give your problems to a classmate to solve.



Records
\$3.98



Book
\$4.35



Monkey 62 Kilograms Bear 377 Kilograms Tiger 183 Kilograms

Deer 125 Kilograms

Lion 157 Kilograms



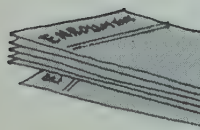
Empire State
Building
381 meters



Sears
Building
442 meters



John Hancock
Center
344 meters



JEFFERSON SCHOOL ENROLLMENT		
Grade 1		123
Grade 2		96
Grade 3		176
Grade 4		198
Grade 5		84
Grade 6		117



Height in centimeters	
Jane	108
Bill	120
Tom	135
Kathy	116
Sue	126
Jan	138
Fred	142

● Fun with Subtraction

1. Study the example. Complete three more.

You choose
a number.

EXAMPLE:

$$\begin{array}{r}
 835 \\
 -538 \\
 \hline
 297 \\
 +792 \\
 \hline
 1089
 \end{array}$$

Choose a number with 3 different digits.
Reverse the digits.
Subtract.
Reverse the Digits.
Add.

4 5 2

9 5 3

What did you discover? _____

2. Study the example. Complete three more.

You choose
a number.

EXAMPLE:

$$\begin{array}{r}
 624 \\
 -426 \\
 \hline
 198 \\
 \swarrow \searrow \\
 9
 \end{array}$$

Choose a number with 3 different digits.
Reverse the digits.
Subtract the smaller number from the larger.
Notice the middle digit.
Add the two outside digits.

9 5 3

7 6 3

What did you discover? _____

3. Study the examples. Do some of your own.
Then check by subtracting the usual way.

EXAMPLES:

$$\begin{array}{r}
 52 \xrightarrow{\text{Add } 3} 55 \\
 -27 \xrightarrow{\text{Add } 3} -30 \\
 \hline
 25 \longleftarrow 25
 \end{array}$$

$$\begin{array}{r}
 83 \xrightarrow{\text{Add } 4} 87 \\
 -46 \xrightarrow{\text{Add } 4} -50 \\
 \hline
 37 \longleftarrow 37
 \end{array}$$

$$\begin{array}{r}
 53 \xrightarrow{\text{Add } 6} 59 \\
 -24 \xrightarrow{\text{Add } 6} -30 \\
 \hline
 29 \longleftarrow 29
 \end{array}$$

$$\begin{array}{r}
 43 \longrightarrow \\
 -28 \longrightarrow \\
 \hline
 \longleftarrow
 \end{array}$$

$$\begin{array}{r}
 72 \longrightarrow \\
 -56 \longrightarrow \\
 \hline
 \longleftarrow
 \end{array}$$

$$\begin{array}{r}
 91 \longrightarrow \\
 -75 \longrightarrow \\
 \hline
 \longleftarrow
 \end{array}$$

● Making and Checking Estimates

Complete at least one of the projects below.

1. How much does your class weigh?



CALCULATION SPACE

A Your estimate: _____

B Calculated Answer: _____

2. Who weighs most— all the persons in your class with last names starting with the letters A-M—or those with N-Z? How much more?



A Your estimate: _____

B Calculated Answer: _____

3. How many days have you been alive?



A Your estimate: _____

B Calculated Answer: _____



4. How tall, in centimeters, are five of your friends?

A Your estimate: _____

B Calculated answer: _____

● Choosing and Ordering Purchases

Suppose you have \$200 to spend. Use a mail order catalog and choose what you would buy. Fill out this order form and calculate the total amount.

ORDER FORM

Name _____
(First Name) (Middle Initial) (Last Name)

Address _____

City _____ State _____ Zip _____

Telephone Number _____ Area Code _____

[illegible]

● Adding and Subtracting Quick-Checks

1. Study the example. Then find the sums and use the method shown to check your answers.

EXAMPLE

	2 7 4		2 + 7 + 4 = 13		1 + 3 = 4		4 + 6 + 8 = 18,
	5 8 2	→	5 + 8 + 2 = 15	→	1 + 5 = 6	→	1 + 8 = 9
	+ 6 4 7		6 + 4 + 7 = 17		1 + 7 = 8		
	<u>1 5 0 3</u>		1 + 5 + 0 + 3 = 9				
			↓				
			Add until you get a single digit.				
							If the final sums are the same, you probably added correctly in the problem.

A

$$\begin{array}{r} 473 \\ 268 \\ + 947 \\ \hline \end{array}$$

B

$$\begin{array}{r} 874 \\ 1369 \\ + 498 \\ \hline \end{array}$$

C

$$\begin{array}{r} 647 \\ 984 \\ + 392 \\ \hline \end{array}$$

2. Study the example. Then find the differences and use the method shown to check your answers.

EXAMPLE

	8 4 5		8 + 4 + 5 = 17		1 + 7 = 8		If you have subtracted correctly in the problem, these numbers will be the same.
	- 3 2 7		3 + 2 + 7 = 12		1 + 2 = 3		
	<u>5 1 8</u>		5 + 1 + 8 = 14		1 + 4 = 5		
							3 + 5 = 8

A

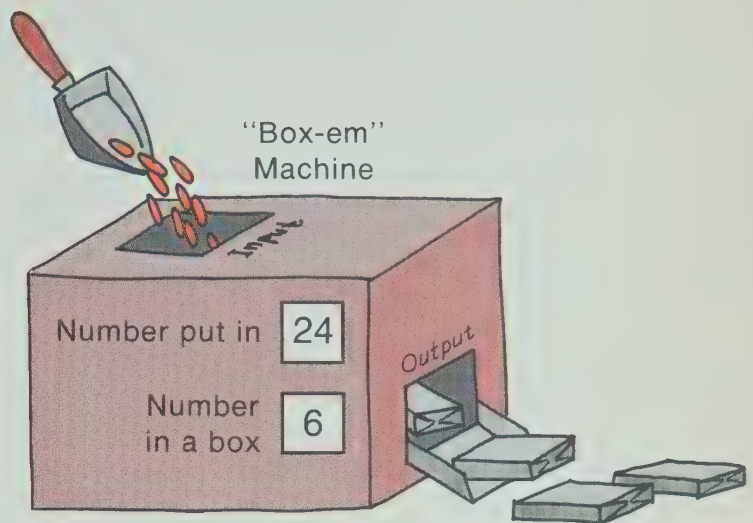
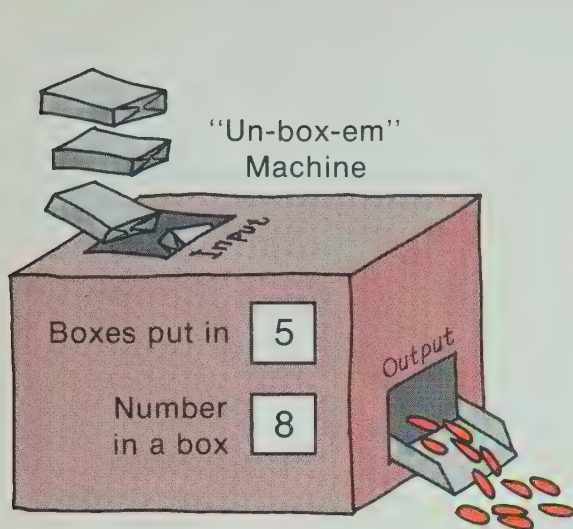
$$\begin{array}{r} 934 \\ - 267 \\ \hline \end{array}$$

B

$$\begin{array}{r} 784 \\ - 359 \\ \hline \end{array}$$

C

$$\begin{array}{r} 1093 \\ - 768 \\ \hline \end{array}$$



When a box of things is put into the “Un-box-em” Machine, it takes them out of the box. When you put things in the “Box-em Machine, it places them in boxes. Complete the following tables.

1. Record for the “Un-box-em” Machine

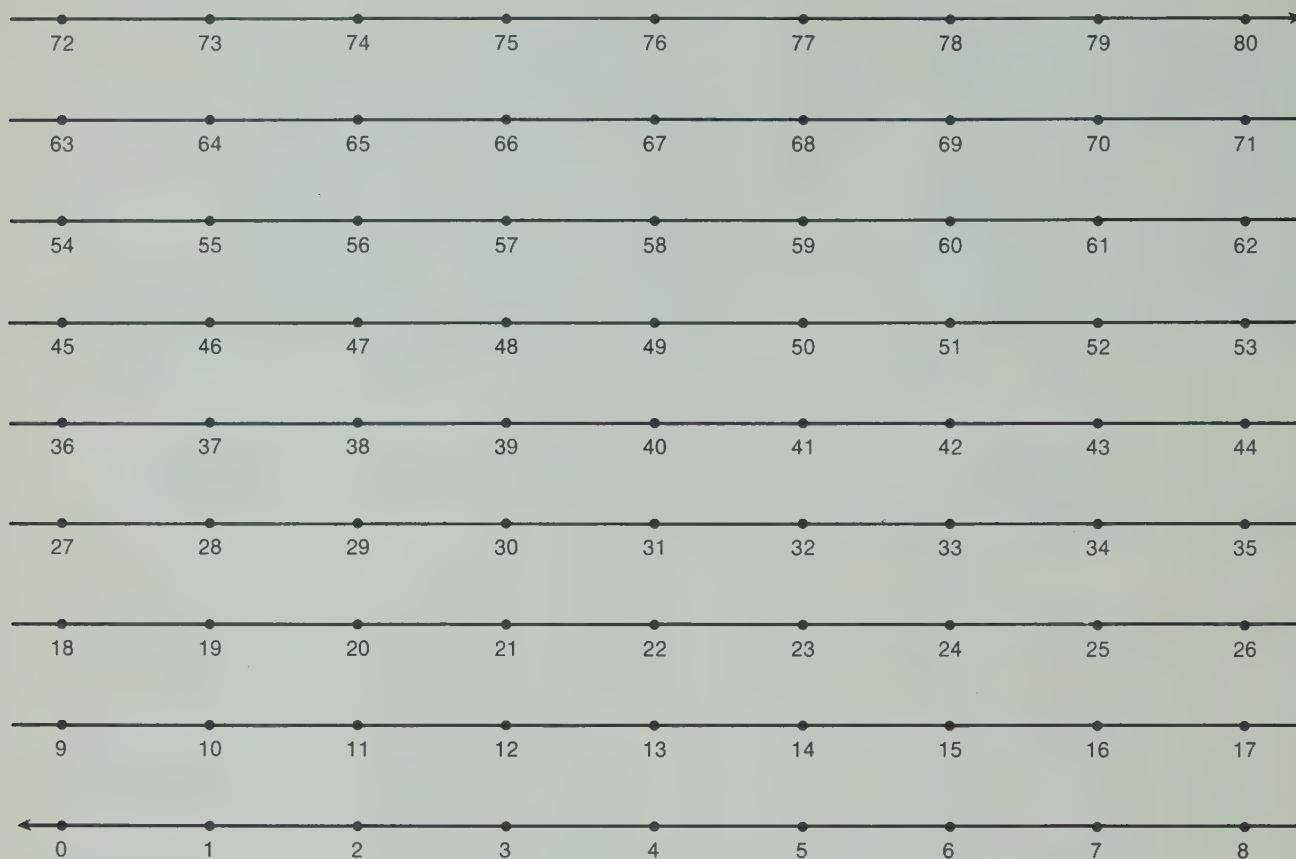
	Item	Input (number of boxes)	Number in each box	Output (number of items)
A	Books	6	4	
B	Marbles	8	9	
C	Candy Bars	10	6	
D	Crayons	4	8	
E	Eggs	6	12	
F	Mini-Cars	9	4	
G	Coins	7	6	
H	Cookies	10	12	
I	Stamps		10	50
J	Erasers	8		40

2. Record for the “Box-em” Machine

	Item	Input (number of items)	Number in each box	Output (number of boxes)
A	Pencils	24	6	
B	Apples	20	4	
C	Gum	35	5	
D	Lollipops	32	8	
E	Cards	18	6	
F	Baseballs	36	12	
G	Candy Bars	48	6	
H	Books	28	4	
I	Marbles		10	6
J	Watches	12		3

● Special Number Line Jumps

This number line has been stacked in sections so it will fit on the page. Study the examples to see how to make jumps on the number line. Then complete the tables.

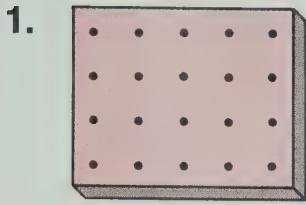


Symbol	0 $\overset{\uparrow}{\textcircled{2}}$	12 $\leftarrow \textcircled{3}$	19 $\overset{\uparrow}{\textcircled{1}}$	18 $\textcircled{5} \rightarrow$	0 $\textcircled{5} \rightarrow$	0 $\overset{\uparrow}{\textcircled{6}}$	72 $\overset{\uparrow}{\textcircled{1}}$	72 $\textcircled{8} \downarrow$	8 $\leftarrow \textcircled{7}$	0 $\overset{\uparrow}{\textcircled{3}}$	0 $\overset{\uparrow}{\textcircled{4}}$	80 $\textcircled{8} \downarrow$
Start	0	12	19	18	0	0	72	72	8	0	0	80
Land	18	9	10	23								
	<div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>E</div> <div>F</div> <div>G</div> <div>H</div>											

Symbol	0 $\overset{\uparrow}{\textcircled{1}}$	28 $\textcircled{2}$	4 $\textcircled{3}$	20 $\textcircled{2}$	0 $\textcircled{5}$	0 $\textcircled{8}$	8 $\textcircled{3}$	8 $\textcircled{8}$	1 $\textcircled{4}$	5 $\textcircled{2}$	25 $\textcircled{1}$	18 $\textcircled{2}$
Start	0	28	4	20	0	0	8	8	1	5	25	18
Land	10	12	28	0								
	<div>A</div> <div>B</div> <div>C</div> <div>D</div> <div>E</div> <div>F</div> <div>G</div> <div>H</div>											

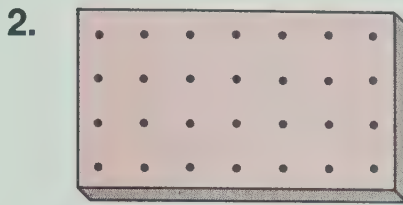
● How Many Nails?

Tell how many nails on each board (including those covered) and write a multiplication equation for each.



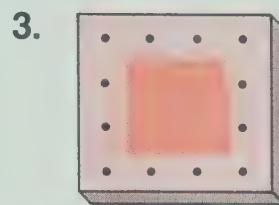
Number of nails 20

Equation: $4 \times 5 = 20$
number of rows number of nails in each row



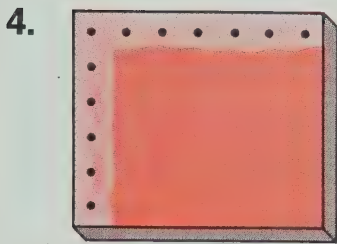
Nails: _____

Equation: _____



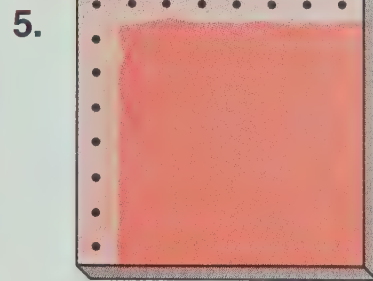
Nails: 16

Equation: _____



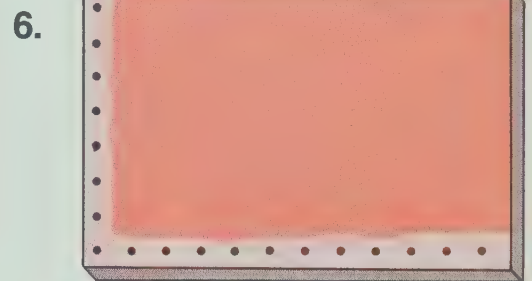
Nails: _____

Equation: _____



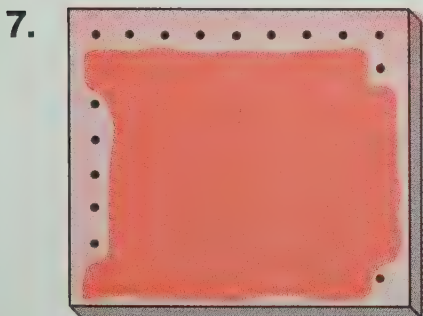
Nails: _____

Equation: _____



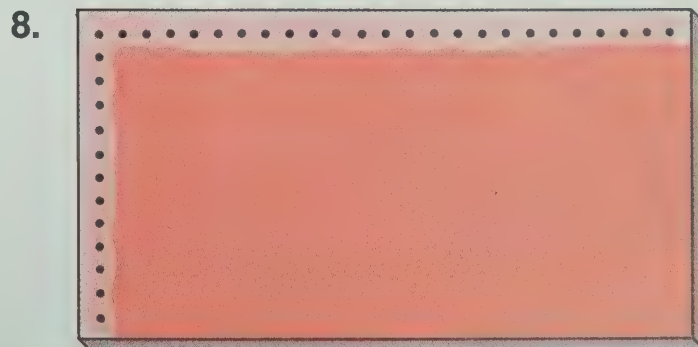
Nails: _____

Equation: _____



Nails: _____

Equation: _____



Nails: _____



Equation: _____

● Money Combinations

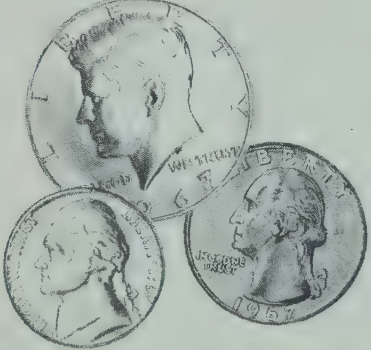

How many different amounts of money can you make by choosing one coin (or bill) from each set? Write the different amounts.

Complete the equations.



1. **1 copper coin** × **4 "silver" coins** = different amounts

		<p>List the amounts here.</p> <p>6¢ 11¢</p>
---	--	---

2. **3 large coins** × **2 small coins** = different amounts

		<p>List the amounts here.</p> <p>51¢ 26¢</p>
---	---	--

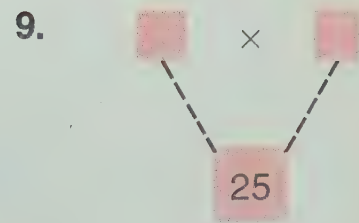
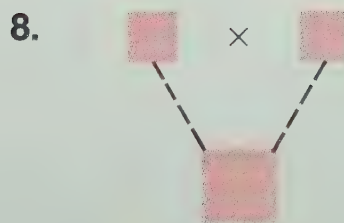
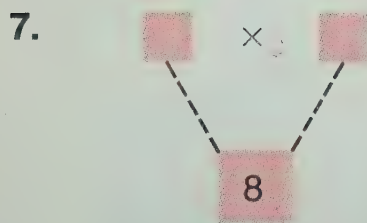
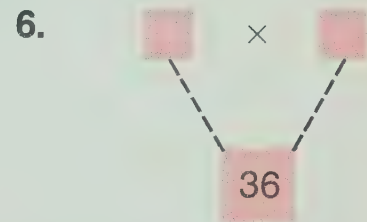
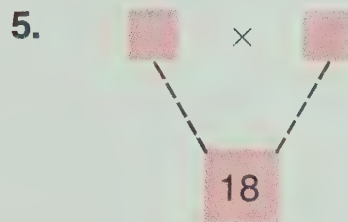
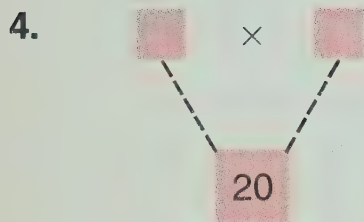
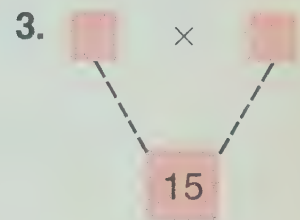
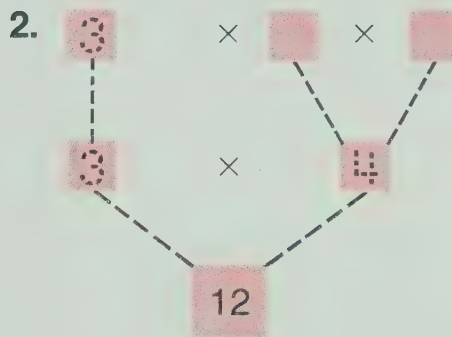
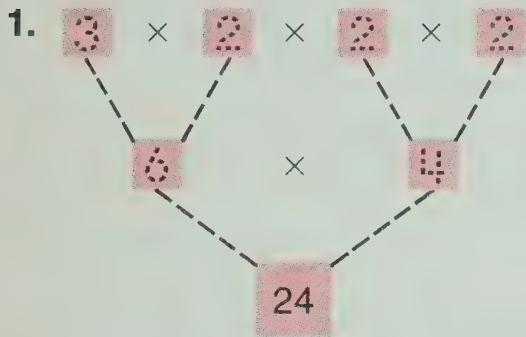
3. **3 bills** × **5 coins** = different amounts

		<p>List the amounts here.</p> <p>\$10.50 \$5.25</p>
---	--	---

● Factor Trees

Help the "Factor Trees" grow as much as you can.

Rule: Do not use 1 in a factor tree.



Make one of your own

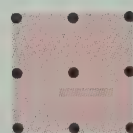
Multiplication Table Patterns

How many products can you find? Write them in the table.

×	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3				3×3 9		3×5 15				
4										
5				5×3 15						
6										
7										
8										
9										

1. Products like 3×3 are called **square numbers**.

Color all the square number boxes blue.



2. Find a row \leftrightarrow and a column \updownarrow in the table in which every box contains the same number. Color the row and the column yellow.
3. Color the row and the column that contain each of the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 brown.
4. If the table were folded on the dotted line, then pairs of numbers such as 15 and 15 would match. Find as many pairs of matching numbers as you can and color the pairs with the same color. Use as many different colors for the pairs as you can.

● A Math Machine

Give the output for each "Math Machine" hookup. Then complete the equation.

1. A



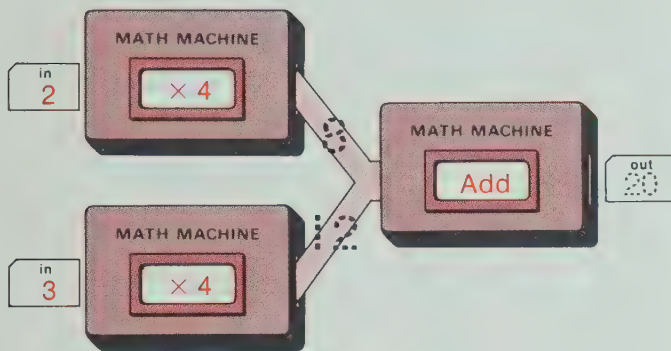
$$(2 + 3) \times 4 = \square$$

2. A



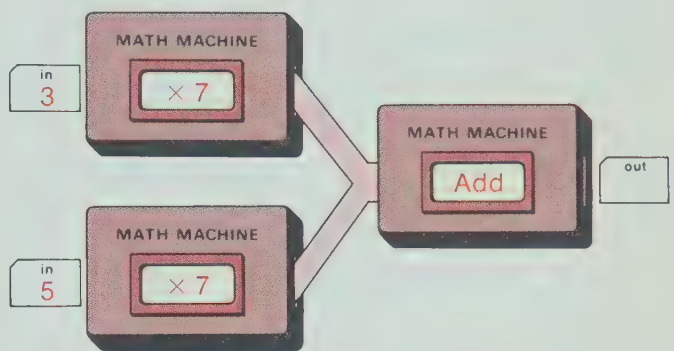
$$(3 + 5) \times 7 = \square$$

B



$$(2 \times 4) + (3 \times 4) = \square$$

B



$$(3 \times 7) + (5 \times 7) = \square$$

3. A



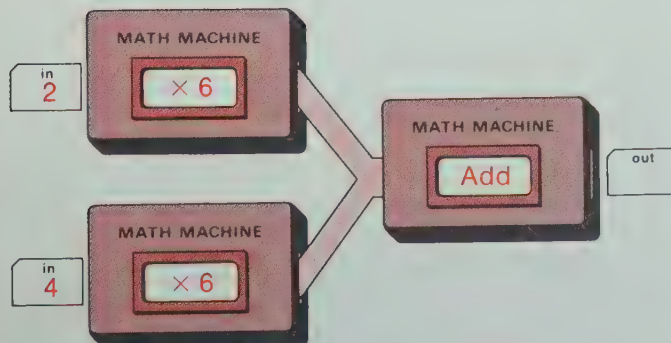
$$(2 + 4) \times 6 = \square$$

4. A



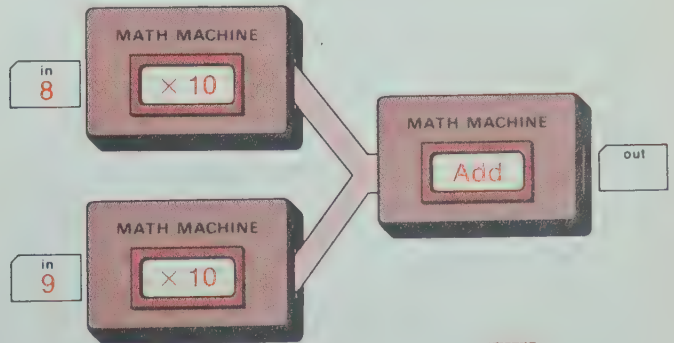
$$(8 + 9) \times 10 = \square$$

B



$$(2 \times 6) + (4 \times 6) = \square$$

B



$$(8 \times 10) + (9 \times 10) = \square$$

Finger Multiplication

To make a finger calculator, label each finger as shown in the picture.

Study the example and then fill in the blanks.



1. EXAMPLE:

Left Hand



Right Hand

- A How many open fingers (or thumbs)?
- B How many closed fingers on left?
- C How many closed fingers on right?
- D Product of closed fingers. $8 \times 7 =$

3.

Left Hand



Right Hand

- A How many open fingers (or thumbs)?
- B How many closed fingers on left?
- C How many closed fingers on right?
- D Product of closed fingers. $7 \times 6 =$

5.

Left Hand



Right Hand

- A How many open fingers (or thumbs)?
- B How many closed fingers on left?
- C How many closed fingers on right?
- D Product of closed fingers. $8 \times 6 =$

7.

Left Hand



Right Hand

- A How many open fingers (or thumbs)?
- B How many closed fingers on left?
- C How many closed fingers on right?
- D Product of closed fingers. $10 \times 7 =$

2.

Left Hand



Right Hand

Right Hand

- A How many open fingers (or thumbs)?
- B How many closed fingers on left?
- C How many closed fingers on right?
- D Product of closed fingers. $9 \times 6 =$

4.

Left Hand



Right Hand

- A How many open fingers (or thumbs)?
- B How many closed fingers on left?
- C How many closed fingers on right?
- D Product of closed fingers. $9 \times 7 =$

6.

Left Hand



Right Hand

- A How many open fingers (or thumbs)?
- B How many closed fingers on left?
- C How many closed fingers on right?
- D Product of closed fingers. $9 \times 9 =$

8.

Try some on your fingers.

- A How many open fingers (or thumbs)?
- B How many closed fingers on left?
- C How many closed fingers on right?
- D Product of closed fingers. $10 \times 10 =$

● Facts About Facts

Complete each part.

$$2 \times 9 = 18 \rightarrow 1 + 8 = \boxed{9}$$

$$3 \times 9 = \underline{\quad} \rightarrow \underline{\quad} + \underline{\quad} = \boxed{\quad}$$

$$4 \times 9 = \underline{\quad} \rightarrow \underline{\quad} + \underline{\quad} = \boxed{\quad}$$

$$5 \times 9 = \underline{\quad} \rightarrow \underline{\quad} + \underline{\quad} = \boxed{\quad}$$

$$6 \times 9 = \underline{\quad} \rightarrow \underline{\quad} + \underline{\quad} = \boxed{\quad}$$

$$7 \times 9 = \underline{\quad} \rightarrow \underline{\quad} + \underline{\quad} = \boxed{\quad}$$

$$8 \times 9 = \underline{\quad} \rightarrow \underline{\quad} + \underline{\quad} = \boxed{\quad}$$

What did you discover? _____

$$1 \times 8 = 8 \rightarrow \quad = \boxed{8}$$

$$2 \times 8 = 16 \rightarrow 1 + 6 = \boxed{7}$$

$$3 \times 8 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$4 \times 8 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$5 \times 8 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$6 \times 8 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}^*$$

$$7 \times 8 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}^*$$

$$8 \times 8 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}^*$$

*Add the digits until you get a single digit to write in the box.

What did you discover? _____

$$2 \times 6 = 12 \rightarrow 1 + 2 = \boxed{3}$$

$$3 \times 6 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$4 \times 6 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$5 \times 6 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$6 \times 6 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$7 \times 6 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$8 \times 6 = 48 \rightarrow 4 + 8 = 12 \rightarrow 1 + 2 = \boxed{3}$$

$$9 \times 6 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$10 \times 6 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

What did you discover? _____

$$1 \times 5 = 5 \rightarrow \quad = \boxed{5}$$

$$2 \times 5 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$3 \times 5 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$4 \times 5 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$5 \times 5 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$6 \times 5 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$7 \times 5 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$8 \times 5 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

$$9 \times 5 = \underline{\quad} \rightarrow \underline{\quad} = \boxed{\quad}$$

What did you discover? _____

Combining Operations

The output of the first machine becomes the input of the second machine. Give the numbers in the table or the missing rule for each exercise.

1. **THE FUNCTION MACHINE**

FUNCTION RULE		
Multiply by 4		

INPUT	OUTPUT
9	36

→

THE FUNCTION MACHINE

FUNCTION RULE		
Add 7		

INPUT	OUTPUT
36	43

	First Input	Final Output
	9	43
A	8	
B	7	
C	6	

2. **THE FUNCTION MACHINE**

FUNCTION RULE		
Multiply by 7		

INPUT	OUTPUT
8	56

→

THE FUNCTION MACHINE

FUNCTION RULE		
Subtract 10		

INPUT	OUTPUT
56	46

	First Input	Final Output
	8	46
A	9	
B	10	
C	7	

3. **THE FUNCTION MACHINE**

FUNCTION RULE		
Multiply by 10		

INPUT	OUTPUT
9	90

→

THE FUNCTION MACHINE

FUNCTION RULE		
Add 50		

INPUT	OUTPUT
90	140

	First Input	Final Output
	9	140
A	8	
B	7	
C	6	

4. **THE FUNCTION MACHINE**

FUNCTION RULE		
Multiply by 9		

INPUT	OUTPUT
7	63

→

THE FUNCTION MACHINE

FUNCTION RULE		
A		

INPUT	OUTPUT
63	54

	First Input	Final Output
	7	54
	6	45
B	5	
C	4	

5. **THE FUNCTION MACHINE**

FUNCTION RULE		
Multiply by 8		

INPUT	OUTPUT
9	72

→

THE FUNCTION MACHINE

FUNCTION RULE		
Add 8		

INPUT	OUTPUT
72	80

	First Input	Final Output
	9	80
A	4	
B		56
C	7	

● Extending the Table

1. How many of these products can you find? Write them in the table. The exercises below the table may help you.

×	5	6	7	8	9	10	11	12	13	14	15
5											
6			42	48							
7				56							
8											
9											
10											
11											
12			84								
13				104							
14											
15											

2. First write the products in the red part of the table. Then use the red part to help you find the products in the light gray and the dark gray part.

You can find 12×7 by adding 6×7 to 6×7 .

A What is 12×7 ? _____ B What is 7×12 ? _____

3. You can find 13×8 by adding 6×8 to 7×8 .

A What is 13×8 ? _____ B What is 8×13 ? _____

● Writing Multiplication Story Problems

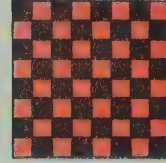
Part of a story problem or a picture suggesting a story problem is given in each exercise. Complete the story problem so that when you solve the equation you solve the problem.

1. Brad bought 6 cartons of cola. There were 8 bottles in each carton.



$$6 \times 8 = \underline{\quad}$$

2. There are 8 squares in one row of a checkerboard.



$$8 \times 8 = \underline{\quad}$$

3. Each baseball team has 9 regular players. There are 6 teams in the league.



$$6 \times 9 = \underline{\quad}$$

4. Jane works 5 hours each day.



$$7 \times 5 = \underline{\quad}$$

5. _____



$$9 \times 8 = \underline{\quad}$$

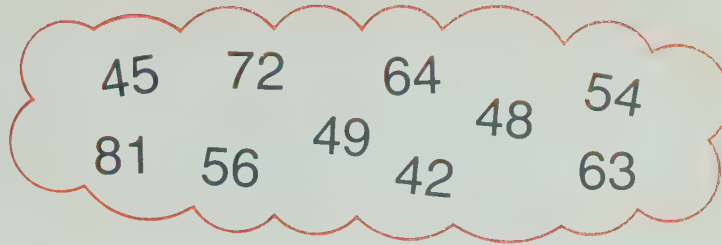
6. _____

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

Make up a problem of your own and write the equation.

●Larger Products

There are just 10 basic-fact products above 40.



How many basic-fact equations can you write using these numbers as products?

_____ × _____ = _____	_____ × _____ = _____
_____ × _____ = _____	_____ × _____ = _____
_____ × _____ = _____	_____ × _____ = _____
_____ × _____ = _____	_____ × _____ = _____
_____ × _____ = _____	_____ × _____ = _____
_____ × _____ = _____	_____ × _____ = _____
_____ × _____ = _____	_____ × _____ = _____
_____ × _____ = _____	_____ × _____ = _____

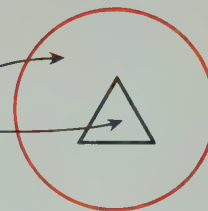
Now see if you can do these in less than 2 minutes. Remember the answers are given above.

$6 \times 8 =$ _____	$7 \times 9 =$ _____	$6 \times 7 =$ _____
$9 \times 6 =$ _____	$9 \times 9 =$ _____	$9 \times 5 =$ _____
$7 \times 7 =$ _____	$8 \times 8 =$ _____	$8 \times 9 =$ _____

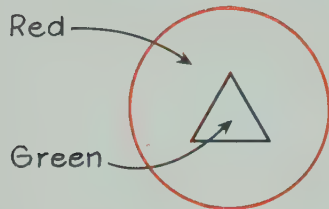
● How Many Ways?

Complete each list.

1. Use 3 colors (Red, Blue, or Yellow) for this part.
Use 2 colors (Green or Brown) for this part.



How many different designs can you make? _____
Draw and color them in the space below.



2. You are a baseball coach. You have 4 pitchers (Aker, Bar, Cox, and Dunn) and 3 catchers (Ray, Star, and Todd). A pitcher-catcher combination is called a battery. How many different batteries

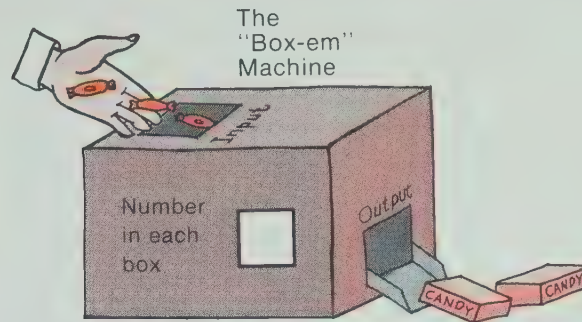


can you choose? _____ List them here: (A, R) (A, S)












3. You have 5 blouses (or shirts), (Blue, Green, White, Pink, and Tan) and 3 skirts (or trousers), (Brown, Red, and Black). How many different blouse, skirt (or shirt, trouser) outfits can you

choose? _____ List them here: (blue, brown)

The "Box-em" Machine puts the same number of objects in each box.



Complete this record sheet for the machine and solve the equations.

Record for the "Box-em" Machine				
ITEM	INPUT (number of items)	Number in each box	OUTPUT (number of boxes)	EQUATION
Crayons	32	8		$32 \div 8 =$
Cookies	24	6		
Felt Pens	28	4		
Toy Cars	35	5		
Marbles	54	9		
Erasers	360	9		
Candy Bars	18		3	$18 \div 3 =$
Rulers	90		9	
Ping-Pong Balls	32		4	
Books	20		4	
				

Choose an item of your own.

● Nailboard Coverups


Some of the nailboards are partly covered. Figure out how many rows of nails are on each board and write a division equation.

1. 
30 nails altogether


Number of rows 5

$$\begin{array}{c} 30 \\ \uparrow \end{array} \div \begin{array}{c} 6 \\ \uparrow \end{array} = \begin{array}{c} 5 \\ \uparrow \end{array}$$

Number of nails in all. Number of nails in each row. No. of rows.

2. 
21 nails altogether

Number of rows _____

3. 
45 nails altogether

Number of rows _____

4. 
36 nails altogether

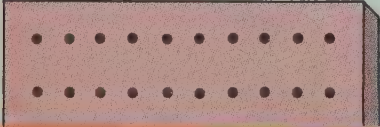
Number of rows _____

5. 
40 nails altogether

Number of rows _____

6. 
35 nails altogether


Number of rows _____

7. 
80 nails altogether

Number of rows _____

8. 
27 nails altogether

Number of rows _____

9. 
60 nails altogether

Number of rows _____

● Subtracting to Find Quotients

Complete the following by subtracting until you reach zero.
Then solve the division equation.

EXAMPLE:

108	
— 9	(1)
99	
— 9	(2)
90	
— 9	(3)
81	
— 9	(4)
72	
— 9	(5)
63	
— 9	(6)
54	
— 9	(7)
45	
— 9	(8)
36	
— 9	(9)
27	
— 9	(10)
18	
— 9	(11)
9	
— 9	(12)
0	

$108 \div 9 = 12$

1. $\begin{array}{r} 72 \\ - 12 \\ \hline \end{array}$

$72 \div 12 =$

2. $\begin{array}{r} 120 \\ - 15 \\ \hline \end{array}$

$120 \div 15 =$

3. $\begin{array}{r} 104 \\ - 13 \\ \hline \end{array}$

$104 \div 13 =$

4. $\begin{array}{r} 126 \\ - 18 \\ \hline \end{array}$

$126 \div 18 =$

Finding Missing Factors

In each mini-multiplication table the products are given.
Can you find the missing factors and write them in the tables?

1.

×	5	8
0	0	0
2	10	16

2.

×		
	3	7
	12	28

3.

×		
	24	12
	12	6

4.

×		
	6	15
	8	20

5.

×		
	24	32
	42	56

6.

×		
	10	18
	45	81

7.

×		
	27	15
	72	40

8.

×		
	24	18
	20	15

9.

×		
	20	45
	32	72

10.

×		
	36	8
	63	14

11.

×		
	72	54
	40	30

12.

×		
	63	54
	56	48

● Division and Multiplication

When 2 function machines are hooked together, the output of the first machine becomes the input for the second machine. Give the numbers in the table or the missing rule for each exercise.

1. **THE FUNCTION MACHINE**

FUNCTION RULE		
Multiply by 7		

INPUT	OUTPUT
4	28

→

THE FUNCTION MACHINE

FUNCTION RULE		
Divide by 7		

INPUT	OUTPUT
28	4

	First Input	Final Output
	4	4
A	6	_____
B	9	_____
C	_____	12

2. **THE FUNCTION MACHINE**

FUNCTION RULE		
Multiply by 9		

INPUT	OUTPUT
6	54

→

THE FUNCTION MACHINE

FUNCTION RULE		

INPUT	OUTPUT
54	6

	First Input	Final Output
	6	6
	2	2
A	8	_____
B	_____	52

3. **THE FUNCTION MACHINE**

FUNCTION RULE		
Divide by 2		

INPUT	OUTPUT
16	8

→

THE FUNCTION MACHINE

FUNCTION RULE		
Multiply by 4		

INPUT	OUTPUT
8	32

	First Input	Final Output
	16	32
A	12	_____
B	14	_____
C	10	_____

4. **THE FUNCTION MACHINE**

FUNCTION RULE		
Divide by 6		

INPUT	OUTPUT
24	4

→

THE FUNCTION MACHINE

FUNCTION RULE		
Multiply by 8		

INPUT	OUTPUT
4	32

	First Input	Final Output
	24	32
A	30	_____
B	48	_____
C	_____	16

5. **THE FUNCTION MACHINE**

FUNCTION RULE		
Multiply by 10		

INPUT	OUTPUT
4	40

→

THE FUNCTION MACHINE

FUNCTION RULE		
Divide by 2		

INPUT	OUTPUT
40	20

	First Input	Final Output
	4	20
A	5	_____
B	6	_____
C	9	_____

● Writing Division Story Problems

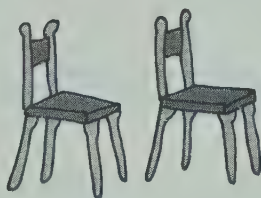
Part of a story problem or a picture suggesting a story problem is given in each exercise. Complete the story problem so that when you solve the equation you have solved the story problem.

1. Pam's Girl Scout troupe had 56 boxes of cookies to sell. There were eight girls in her troupe.



$$56 \div 8 = \underline{\hspace{2cm}}$$

3. Mrs. Good wanted to arrange the chairs for a movie in her classroom. She wanted 9 chairs in each row.



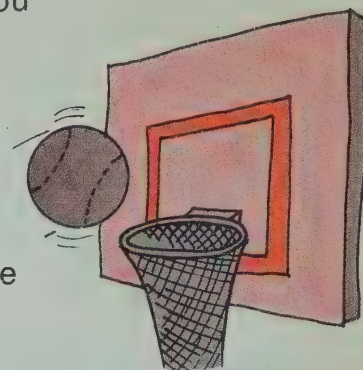
$$27 \div 9 = \underline{\hspace{2cm}}$$

5.



$$24 \div 6 = \underline{\hspace{2cm}}$$

2. Ted's gym class wanted to play basketball. There were 35 boys in the class.



$$35 \div 5 = \underline{\hspace{2cm}}$$

4. Jan's family drove at a speed of 50 kilometers each hour on a trip to Bigtown.



$$250 \div 50 = \underline{\hspace{2cm}}$$

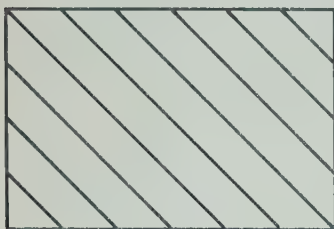
6.

$$\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

Make up a division problem of your own and write the equation.

In the space at the bottom, draw **parallel lines** following steps 1 to 4.

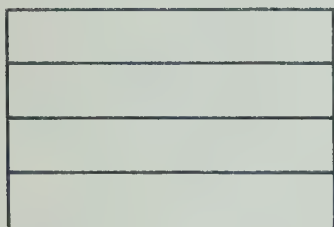
Step 1: Draw these.



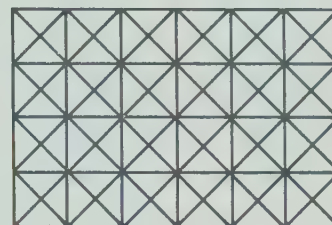
Step 2: Draw these.



Step 3: Draw these.

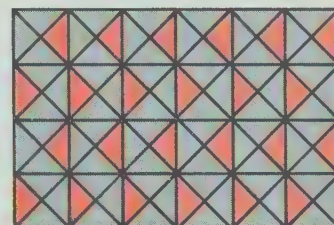


Step 4: Draw these.



Your design should look like this.

This figure shows one possible design using red and gray.



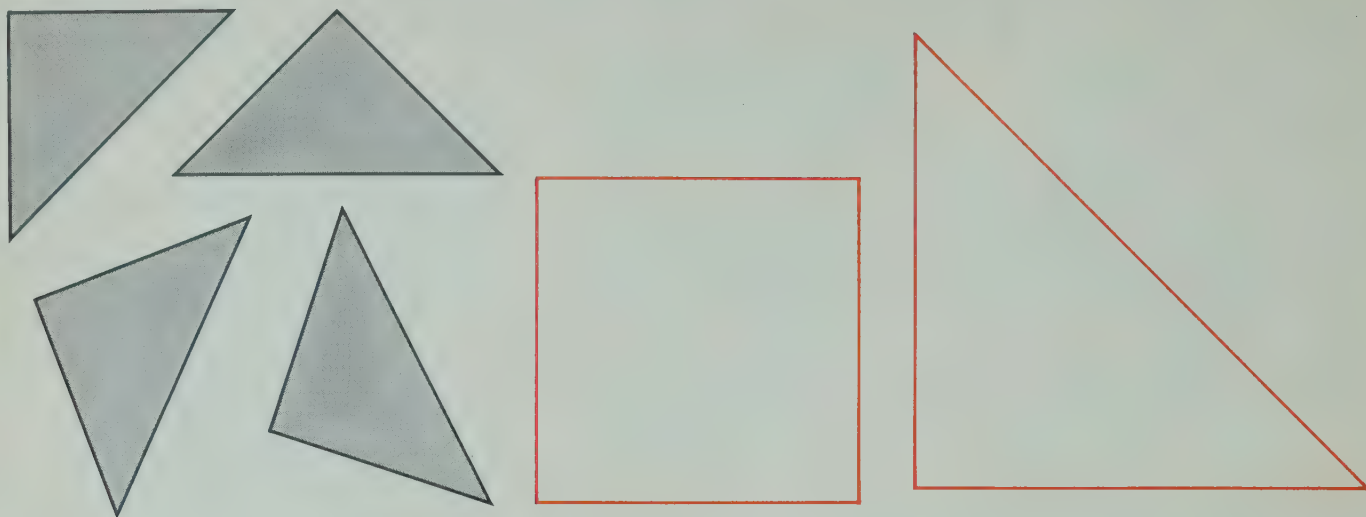
Color a design of your own on the grid you made below.



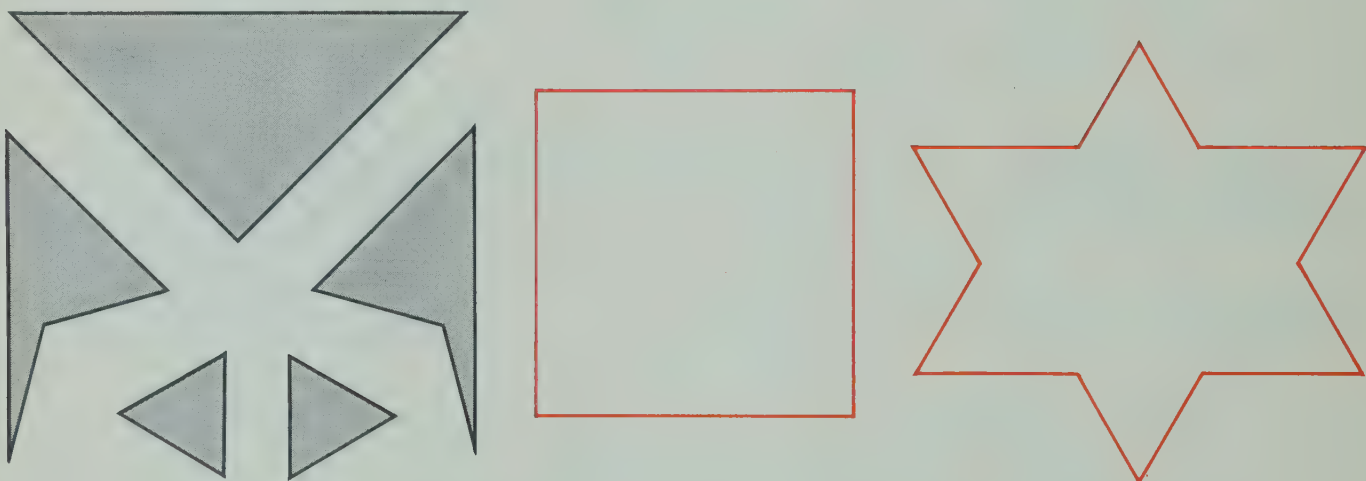
●Puzzle Pieces

Cut out the gray pieces. Use all the pieces and fit them inside the red outline(s).

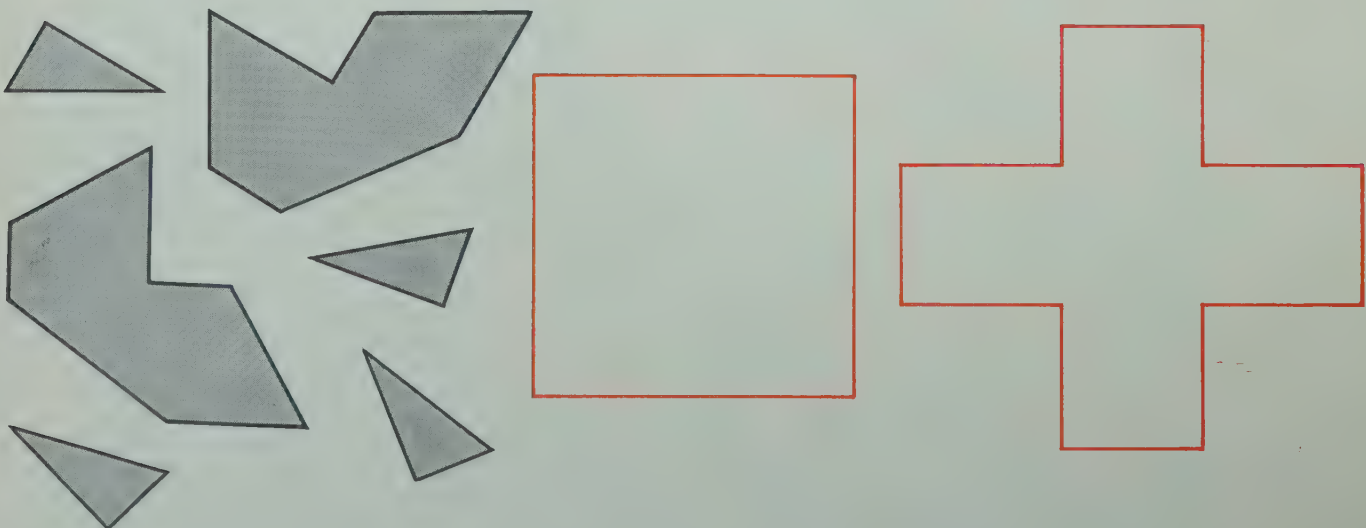
1.



2.

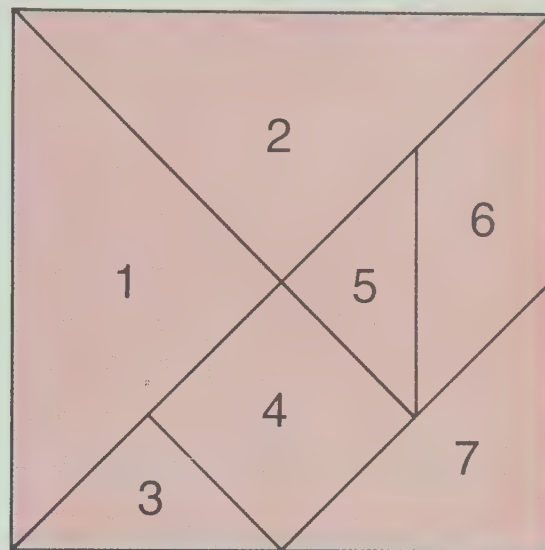


3.

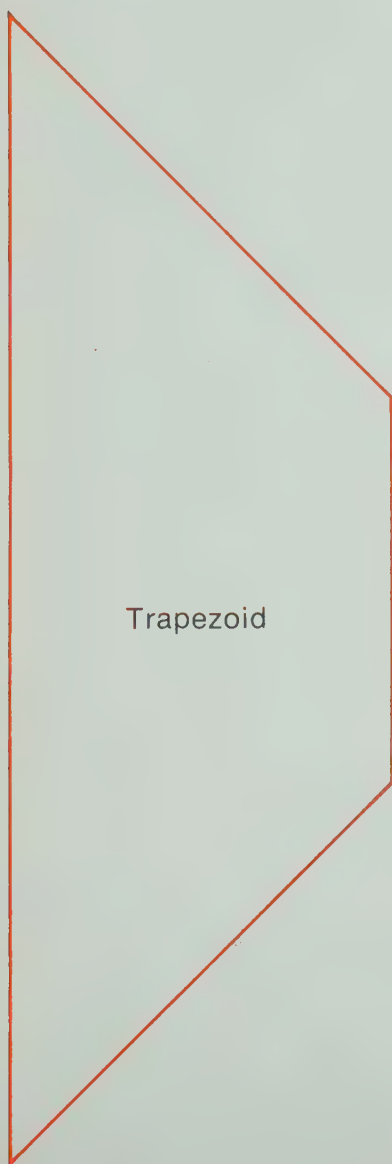


● *The Tangram Puzzle*

Trace and cut out the 7 **Tangram** pieces. Then figure out how to fit all the pieces, without overlapping, in each red outline below.



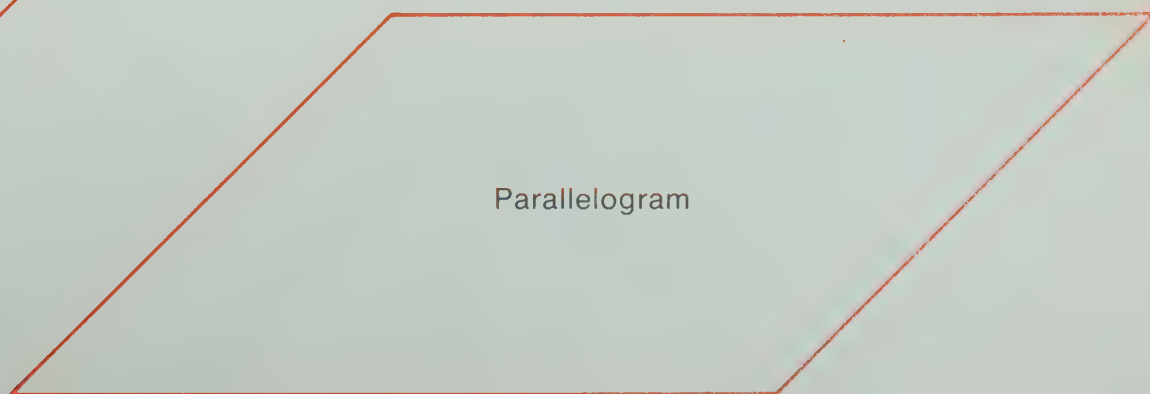
TANGRAM PIECES



Trapezoid



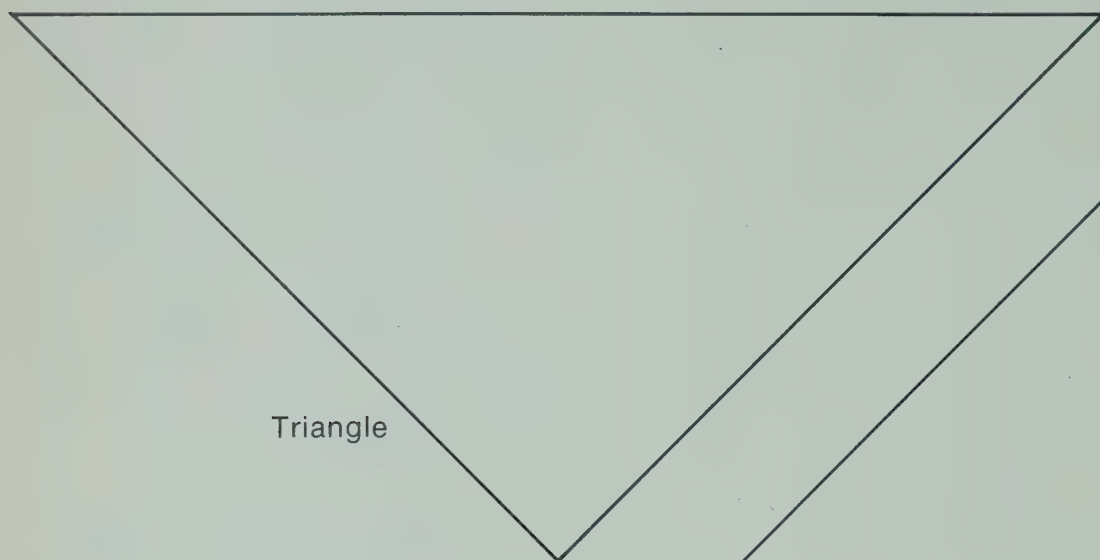
Rectangle



Parallelogram

●Tangram Polygons

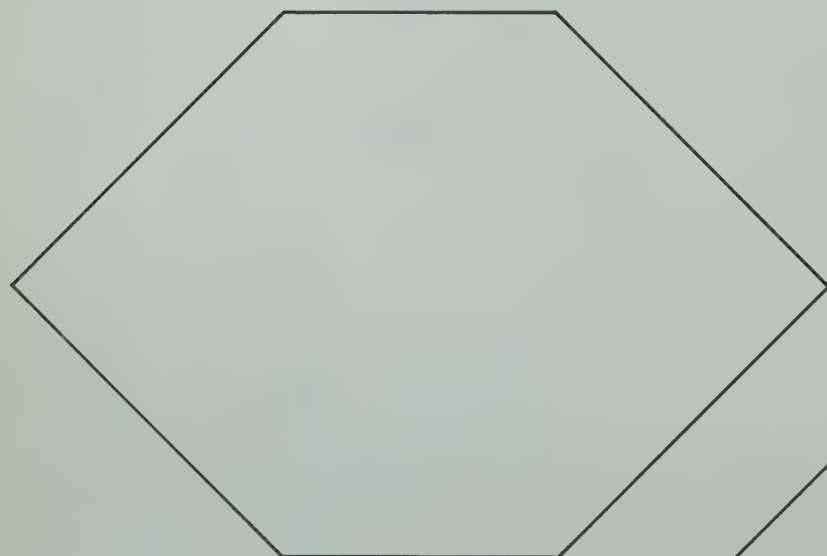
Use all your **Tangram** pieces. Draw lines to show how to completely fill, each of the **polygon** outlines with no overlapping.



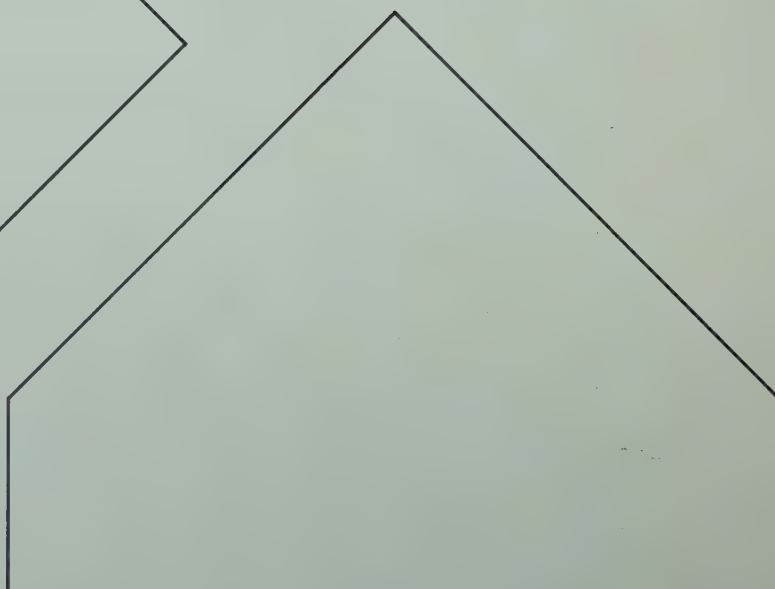
Triangle



Quadrilateral



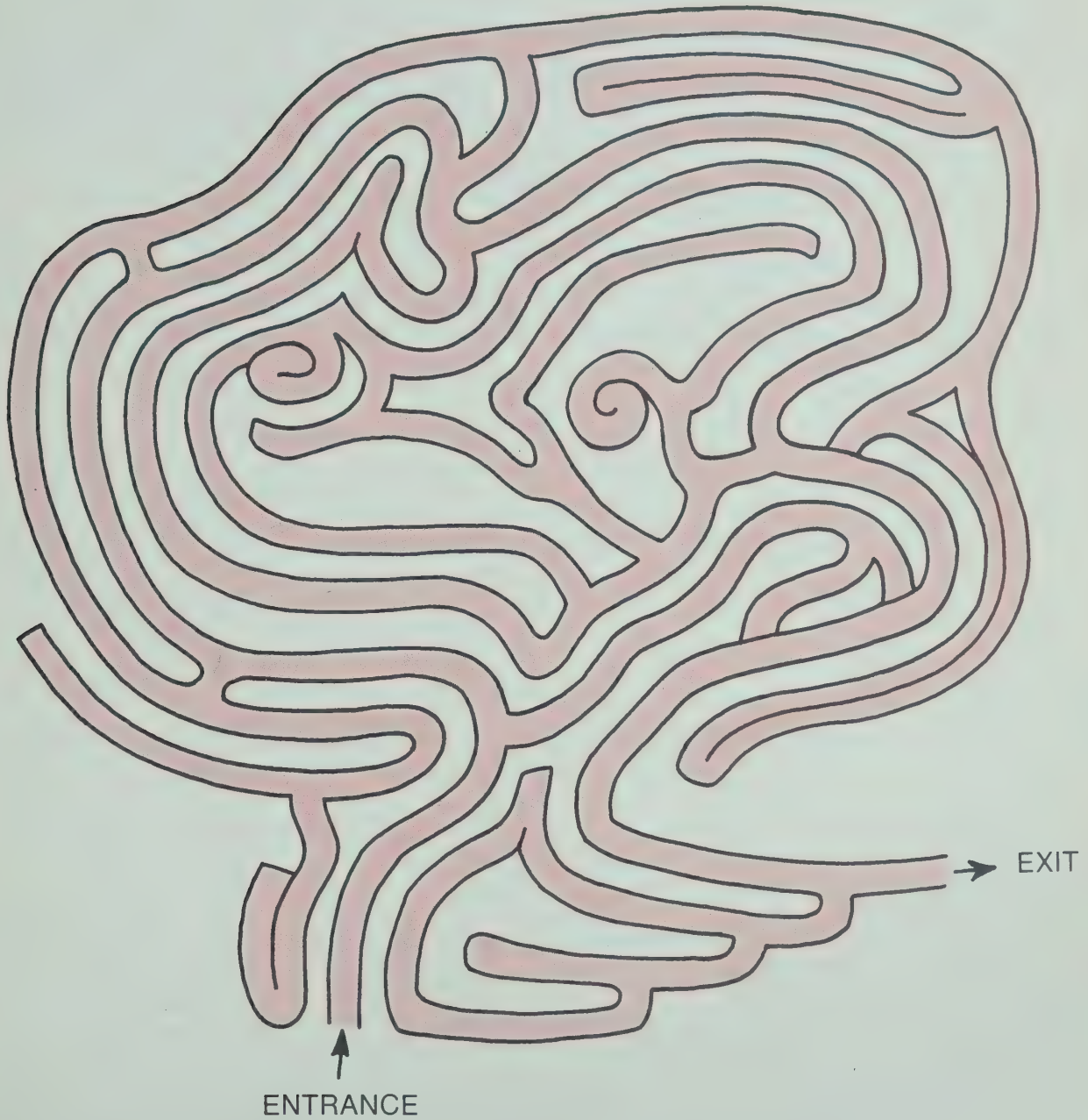
Hexagon



Pentagon


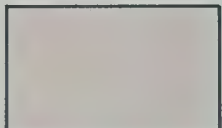



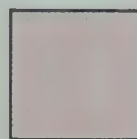
● Solving a Maze

Can you find a path from the ENTRANCE to the EXIT?
Show it with your pencil.



● Symmetry

Complete this table. Find as many different lines of **symmetry** as you can. Draw them on the figure.

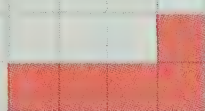
	Figure	Number of Sides	Number of Vertices (Corners)	Number of Lines of Symmetry
1.	 Isosceles Triangle			
2.	 Rectangle			
3.	 Regular Pentagon			
4.	 Equilateral Triangle			
5.	 Regular Hexagon			
6.	 Square			

● "5 Square Figures"

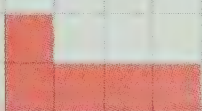
There are 12 *different* figures which can be made by coloring 5 squares on graph paper. (Each square must touch at least one other square along a complete side. Since both **B** and **C** can be flipped or turned to look like **A**, we do not call them different from **A**.)

Color as many of the 12 different "5 square figures" as you can. If any of the figures have lines of symmetry, show them.

These are all considered the same.



A



B



C

This is a starter
for you.



Can you solve these number puzzles?

1. When you multiply the smallest even number (not zero) by itself and add 1, you get me.

Who am I? _____

2. I'm the product of two odd numbers less than 10. I am a "teenager."

Who am I? _____

3. I'm the product of two even numbers less than 10. I can "vote," but I'm under 30.

Who Am I? _____

4. I'm the product of an even and an odd number less than 10 that are "close friends." I'm over 30, but under 50.

Who am I? _____

5. If you multiply the largest odd number less than 10 by itself and add the largest odd number less than 20 to this product you get me.

Who am I? _____

6. I'm twice the product of the largest even number less than 10 times the smallest even number greater than 0.

Who am I? _____

7. I'm the product of two of the smallest 2-digit even numbers. My last digit is zero.

Who am I? _____

8. If you multiply one of the very smallest even numbers by itself enough times, you'll get me. I'm over 50 and under 100.

Who am I? _____

● Even and Odd Numbers

Write one of the even digits 0, 2, 4, 6, or 8 on each **E**

Write one of the odd digits 1, 3, 5, 7, or 9 on each **O**

Be sure your problems are correct. There is usually more than one correct answer.

EXAMPLE:

$$\begin{array}{r} \text{EO} \\ + \quad \text{E} \\ \hline \text{EO} \end{array}$$

Possible
Answer:

$$\begin{array}{r} 43 \\ + \quad 6 \\ \hline 49 \end{array}$$

Can you find a different answer for the above example?

1.

$$\begin{array}{r} \text{E} \\ + \text{E} \\ \hline \text{E} \end{array}$$

2.

$$\begin{array}{r} \text{E} \\ + \text{E} \\ \hline \text{OE} \end{array}$$

3.

$$\begin{array}{r} \text{E} \\ + \text{O} \\ \hline \text{O} \end{array}$$

4.

$$\begin{array}{r} \text{E} \\ + \text{O} \\ \hline \text{OO} \end{array}$$

5.

$$\begin{array}{r} \text{O} \\ + \text{O} \\ \hline \text{E} \end{array}$$

6.

$$\begin{array}{r} \text{O} \\ + \text{O} \\ \hline \text{OE} \end{array}$$

7.

$$\begin{array}{r} \text{EE} \\ + \text{E} \\ \hline \text{EE} \end{array}$$

8.

$$\begin{array}{r} \text{EO} \\ + \text{E} \\ \hline \text{EO} \end{array}$$

9.

$$\begin{array}{r} \text{EO} \\ + \text{O} \\ \hline \text{EE} \end{array}$$

10.

$$\begin{array}{r} \text{EE} \\ + \text{E} \\ \hline \text{OE} \end{array}$$

11.

$$\begin{array}{r} \text{EO} \\ + \text{E} \\ \hline \text{OO} \end{array}$$

12.

$$\begin{array}{r} \text{EO} \\ + \text{O} \\ \hline \text{OE} \end{array}$$

13.

$$\begin{array}{r} \text{EE} \\ + \text{EE} \\ \hline \text{EE} \end{array}$$

14.

$$\begin{array}{r} \text{EE} \\ + \text{EE} \\ \hline \text{OE} \end{array}$$

15.

$$\begin{array}{r} \text{EE} \\ + \text{EO} \\ \hline \text{OO} \end{array}$$

16.

$$\begin{array}{r} \text{EO} \\ + \text{EO} \\ \hline \text{OE} \end{array}$$

17.

$$\begin{array}{r} \text{OO} \\ + \text{EO} \\ \hline \text{OE} \end{array}$$

18.

$$\begin{array}{r} \text{OO} \\ + \text{EO} \\ \hline \text{EE} \end{array}$$

19.

$$\begin{array}{r} \text{E} \\ \times \text{E} \\ \hline \text{E} \end{array}$$

20.

$$\begin{array}{r} \text{E} \\ \times \text{O} \\ \hline \text{E} \end{array}$$

21.

$$\begin{array}{r} \text{O} \\ \times \text{O} \\ \hline \text{O} \end{array}$$

22.

$$\begin{array}{r} \text{E} \\ \times \text{O} \\ \hline \text{OE} \end{array}$$

23.

$$\begin{array}{r} \text{E} \\ \times \text{E} \\ \hline \text{OE} \end{array}$$

24.

$$\begin{array}{r} \text{E} \\ \times \text{E} \\ \hline \text{EE} \end{array}$$

25.

$$\begin{array}{r} \text{O} \\ \times \text{E} \\ \hline \text{OE} \end{array}$$

26.

$$\begin{array}{r} \text{O} \\ \times \text{O} \\ \hline \text{EO} \end{array}$$

27.

$$\begin{array}{r} \text{O} \\ \times \text{O} \\ \hline \text{OO} \end{array}$$

28.

$$\begin{array}{r} \text{OE} \\ \times \text{E} \\ \hline \text{EE} \end{array}$$

29.

$$\begin{array}{r} \text{OE} \\ \times \text{E} \\ \hline \text{EE} \end{array}$$

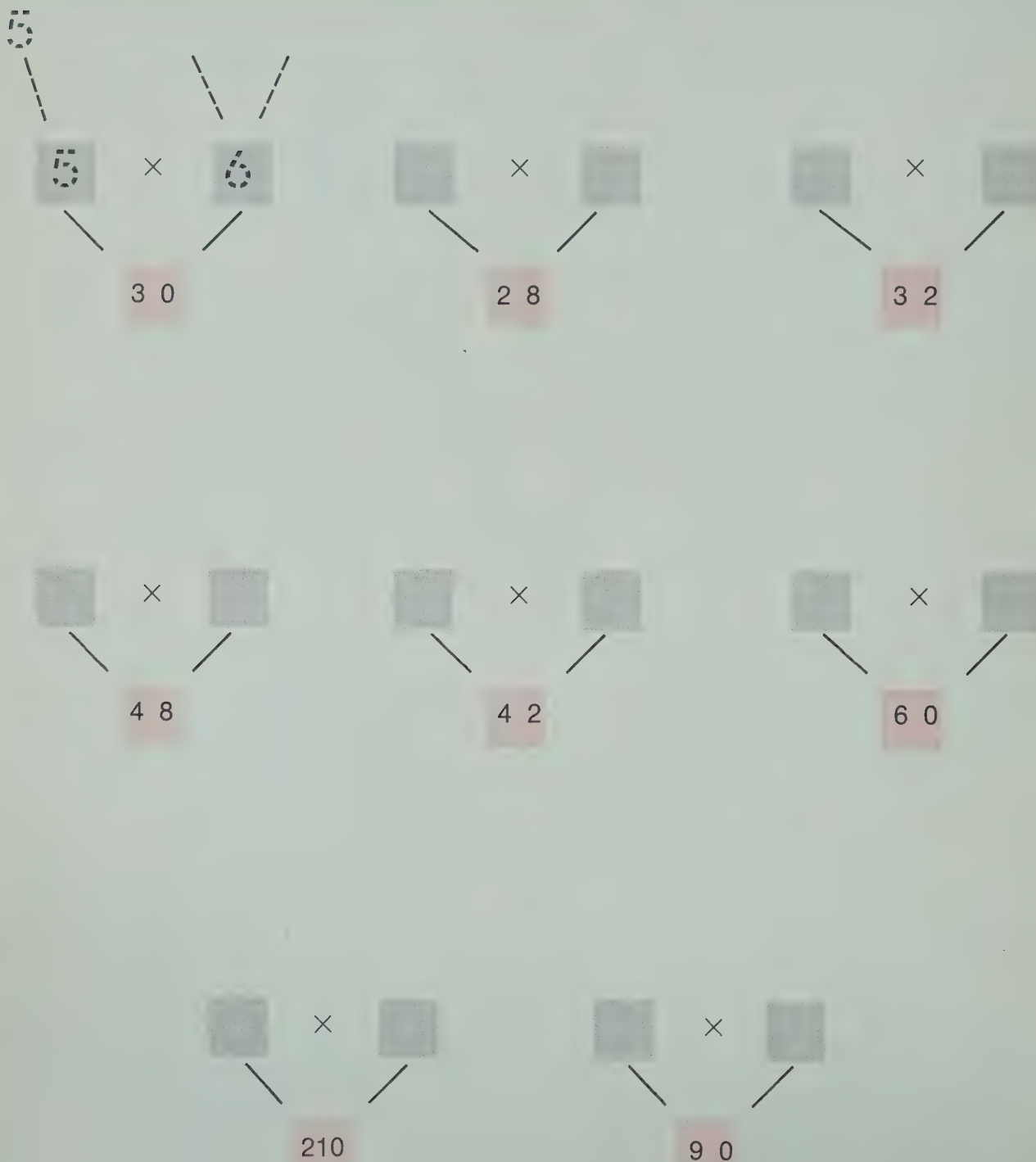
30.

$$\begin{array}{r} \text{EE} \\ \times \text{O} \\ \hline \text{EE} \end{array}$$

More Factor Trees

Make each "factor tree" grow as much as you can.

Remember that 1 is not used in factor trees.



Use another sheet of paper and make some more factor trees of your own.

● Sorting Out Primes

1. Follow these rules:

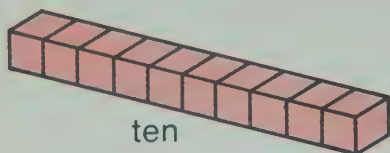
- A** Color 1 gray. It is not a prime number.
- B** 2 is a prime. Do not color 2. A multiple of 2 is not prime. Color all other multiples of 2 red.
- C** 3 is a prime. Do not color 3. A multiple of 3 is not prime. Color all other multiples of 3 blue.
- D** 5 is a prime. Do not color 5. A multiple of 5 is not prime. Color all other multiples of 5 yellow.
- E** 7 is a prime. Do not color 7. A multiple of 7 is not prime. Color all other multiples of 7 green.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

2. The numbers in the squares not colored are the **Prime Numbers**

less than 100. How many prime numbers less than 100 are there? _____

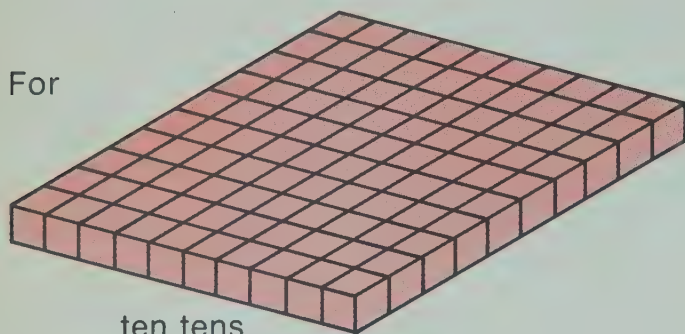
For



ten

We write 10^1 (Read "ten")

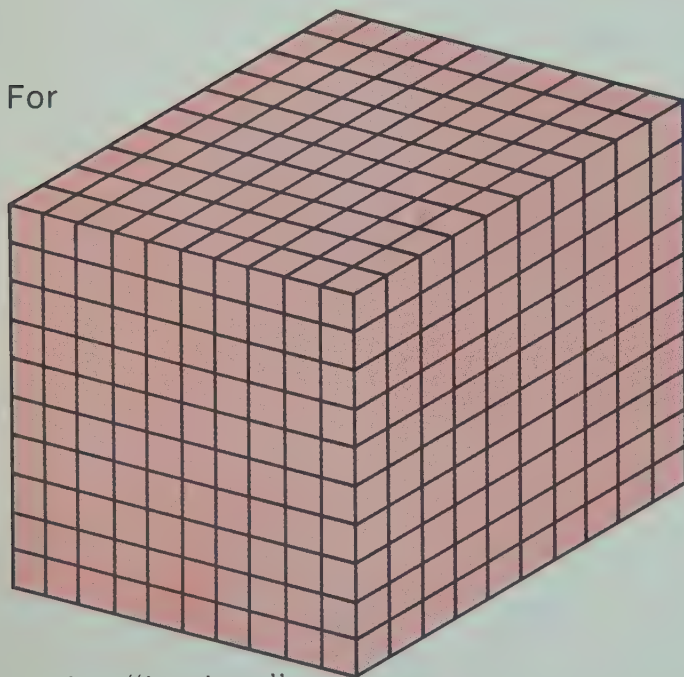
For



ten tens

We write 10^2
(Read "ten squared")

For



ten "ten tens"

We write 10^3
(Read "ten cubed")

How many?

1. $10^2 =$ _____

5. $4 \times 10^3 =$ _____

9. $387 \times 10^1 =$ _____

2. $10^3 =$ _____

6. $23 \times 10^1 =$ _____

10. $25 \times 10^3 =$ _____

3. $2 \times 10^1 =$ _____

7. $42 \times 10^2 =$ _____

11. $423 \times 10^2 =$ _____

4. $3 \times 10^2 =$ _____

8. $9 \times 10^3 =$ _____

12. $99 \times 10^3 =$ _____

Solving Inequalities

Write some of the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 that could be written in the _____ to make a true statement.

Then write the largest possible such number in the _____.

1. 0, 1, 2, 3, 4 4 $\times 10 < 43$
2. _____ $\times 10 < 87$
3. _____ $\times 20 < 123$
4. _____ $\times 30 < 96$
5. _____ $\times 40 < 329$
6. _____ $\times 50 < 213$
7. _____ $\times 60 < 432$
8. _____ $\times 70 < 575$
9. _____ $\times 80 < 735$
10. _____ $\times 90 < 372$

● Using the Multiplication-Addition Principle

Start with the "2 row" of the table and fill in both gray squares. Then find the sum of the products for this row and complete the problem below the table.

Do the same for each of the other rows in the table.

×	10	20	30	1	2	3	4	Product Sum
2		40				6		46
3								
4								
5								
6								
7								
8								
9								

"2 row"

$$\begin{array}{r} 23 \\ \times 2 \\ \hline \end{array}$$

"3 row"

$$\begin{array}{r} 14 \\ \times 3 \\ \hline \end{array}$$

"4 row"

$$\begin{array}{r} 32 \\ \times 4 \\ \hline \end{array}$$

"5 row"

$$\begin{array}{r} 23 \\ \times 5 \\ \hline \end{array}$$

"6 row"

$$\begin{array}{r} 34 \\ \times 6 \\ \hline \end{array}$$

"7 row"

$$\begin{array}{r} 12 \\ \times 7 \\ \hline \end{array}$$

"8 row"

$$\begin{array}{r} 21 \\ \times 8 \\ \hline \end{array}$$

"9 row"

$$\begin{array}{r} 34 \\ \times 9 \\ \hline \end{array}$$

On another sheet of paper write 8 more problems than can be solved using other squares in the table. Fill in these squares to solve the problems.

● Magic With Operations

Choose numbers and follow the directions.

Why do you think the operations are called magic? _____

Choose your numbers.

↓ ↓ ↓

1.

<p>Choose a two-digit number.</p> <p>Double the digit in the tens place.</p> <p>Add 5.</p> <p>Multiply the result by 5.</p> <p>Add the digit in the ones place of the original number.</p> <p>Subtract 25.</p>	<p>53</p> <p>10</p> <p>15</p> <p>75</p> <p>78</p>			
--	---	--	--	--

Work space

Choose your numbers.

↓ ↓ ↓

2.

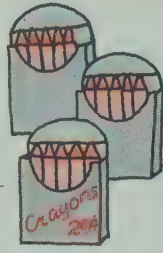
<p>Choose a number.</p> <p>Multiply by 5.</p> <p>Add 7.</p> <p>Multiply this sum by 5.</p> <p>Add 8.</p> <p>Multiply this sum by 4.</p> <p>Cross off the last 2 digits.</p> <p>Subtract 1 from the result.</p>	<p>17</p> <p>85</p> <p>92</p> <p>460</p> <p>468</p> <p>1872</p> <p>18</p>			
--	---	--	--	--

Work space

● Creating Story Problems

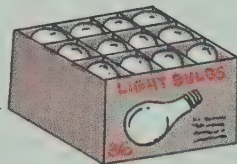
Complete a story problem for each picture that can be solved by solving the equation. Then solve the problem.

1.



$$3 \times 29 =$$

2.



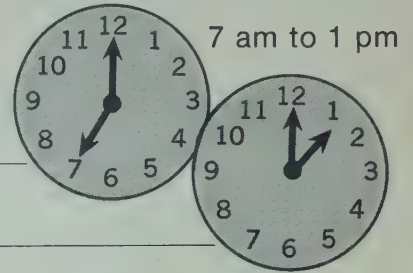
$$5 \times 36 =$$

3.



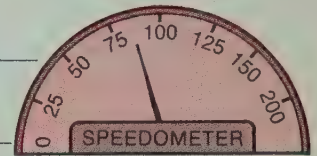
$$6 \times 75 =$$

4.



$$6 \times 85 =$$

5.



85 km/hr

CALENDAR						
S	M	T	W	T	F	S
			1	2	3	4
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

1 day = 24 hours

$$7 \times 24 =$$

6.



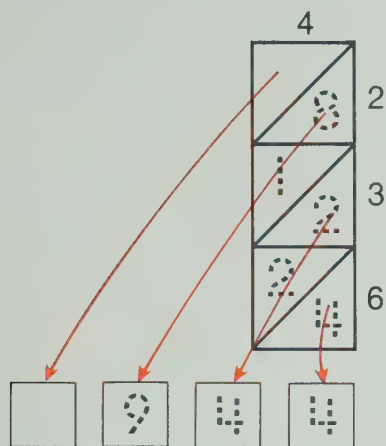
1 Dozen
EGGS

$$8 \times 12 =$$

A New Way to Multiply

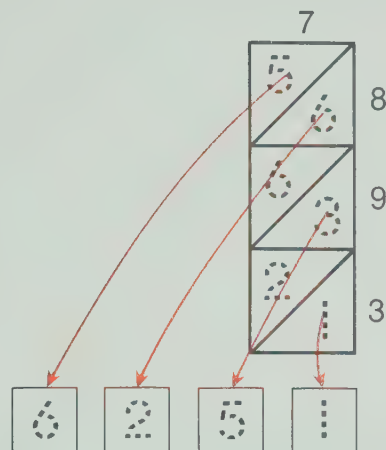
Study and complete the examples. Then use this method to find each product.

EXAMPLES:



Problem:

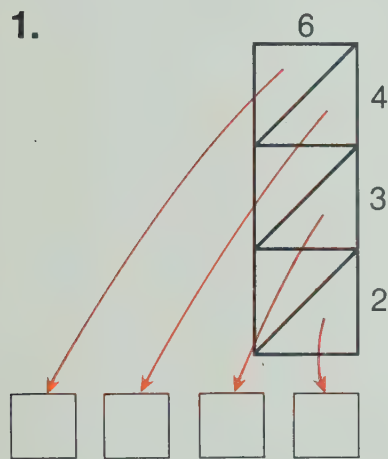
$$\begin{array}{r} 236 \\ \times 4 \\ \hline 944 \end{array}$$



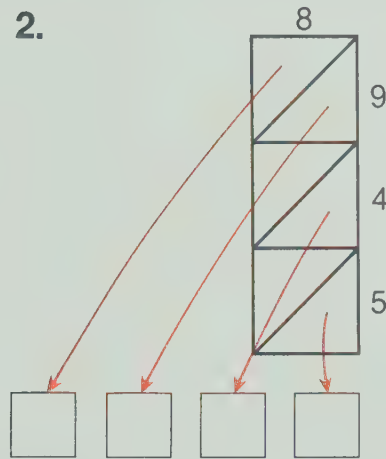
Problem:

$$\begin{array}{r} 893 \\ \times 7 \\ \hline 6251 \end{array}$$

1.

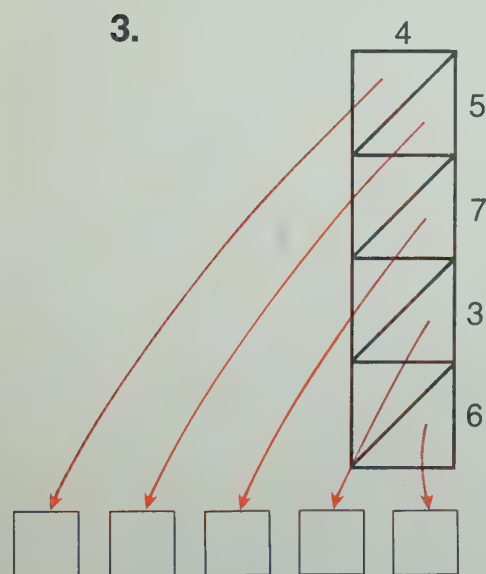


Problem:

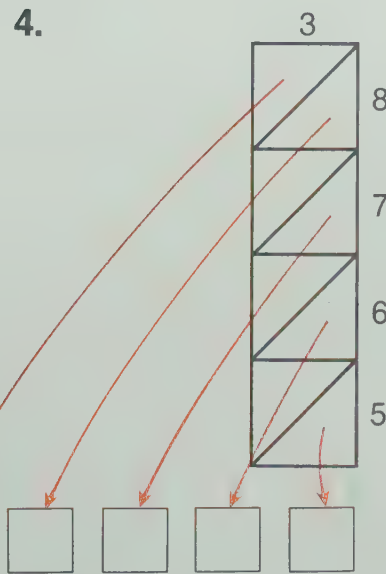


Problem:

3.



Problem:



Problem:

Make up some of your own on another sheet of paper.

Some Product Surprises

1. Find the products.

$$\begin{array}{r} \text{A } 142857 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} \text{B } 142857 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} \text{C } 142857 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} \text{D } 142857 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} \text{E } 142857 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} \text{F } 142857 \\ \times 6 \\ \hline \end{array}$$

What did you discover about these problems?

2. Can you guess this product?

$$\begin{array}{r} \text{A } 142857 \\ \times 7 \\ \hline \end{array}$$

B Did you guess correctly? _____

3. Find the products.

$$\begin{array}{r} \text{A } 12345679 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} \text{B } 37037 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} \text{C } 37037037 \\ \times 3 \\ \hline \end{array}$$

What did you discover about these products? _____

● Estimating Products

Find the products on the left and on the right of the “shaded” problem. Then check (✓) the product you think is the closest estimate to the “shaded” product.

Find the “shaded” product. Did you check (✓) the best estimate?

1.

$$\begin{array}{r} 70 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 73 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 80 \\ \times 4 \\ \hline \end{array}$$

2.

$$\begin{array}{r} 40 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 47 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 50 \\ \times 9 \\ \hline \end{array}$$

3.

$$\begin{array}{r} 60 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 62 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 70 \\ \times 8 \\ \hline \end{array}$$

4.

$$\begin{array}{r} 20 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 29 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 30 \\ \times 7 \\ \hline \end{array}$$

5.

$$\begin{array}{r} 50 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 58 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 60 \\ \times 6 \\ \hline \end{array}$$

6.

$$\begin{array}{r} 80 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 84 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 90 \\ \times 5 \\ \hline \end{array}$$

7.

$$\begin{array}{r} 300 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 312 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 400 \\ \times 4 \\ \hline \end{array}$$

8.

$$\begin{array}{r} 600 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 694 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 700 \\ \times 3 \\ \hline \end{array}$$

9.

$$\begin{array}{r} 800 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 842 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 900 \\ \times 6 \\ \hline \end{array}$$

10.

$$\begin{array}{r} 5000 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 5142 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 6000 \\ \times 3 \\ \hline \end{array}$$

11.

$$\begin{array}{r} 2000 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 2864 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 3000 \\ \times 7 \\ \hline \end{array}$$

12.

$$\begin{array}{r} 8000 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 8672 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 9000 \\ \times 2 \\ \hline \end{array}$$

Finding Larger Products

First find the product on the right and then on the left.
Then use these products to find the "middle product."

1.

Left	Middle	Right
$\begin{array}{r} 68 \\ \times 2 \\ \hline 136 \end{array}$	$\begin{array}{r} 68 \\ \times 23 \\ \hline 204 \end{array}$	$\begin{array}{r} 68 \\ \times 3 \\ \hline 204 \end{array}$
	←	
$\begin{array}{r} \times 10 \\ \hline 1360 \end{array}$		
<hr/>		
$\begin{array}{r} 1564 \end{array}$		

2.

Left	Middle	Right
$\begin{array}{r} 54 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 54 \\ \times 27 \\ \hline \end{array}$	$\begin{array}{r} 54 \\ \times 7 \\ \hline \end{array}$
	←	
$\begin{array}{r} \times 10 \\ \hline \end{array}$		
<hr/>		

3.

Left	Middle	Right
$\begin{array}{r} 38 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 38 \\ \times 42 \\ \hline \end{array}$	$\begin{array}{r} 38 \\ \times 2 \\ \hline \end{array}$

4.

Left	Middle	Right
$\begin{array}{r} 83 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 83 \\ \times 37 \\ \hline \end{array}$	$\begin{array}{r} 83 \\ \times 7 \\ \hline \end{array}$

5.

Left	Middle	Right
$\begin{array}{r} 78 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 78 \\ \times 53 \\ \hline \end{array}$	$\begin{array}{r} 78 \\ \times 3 \\ \hline \end{array}$

6.

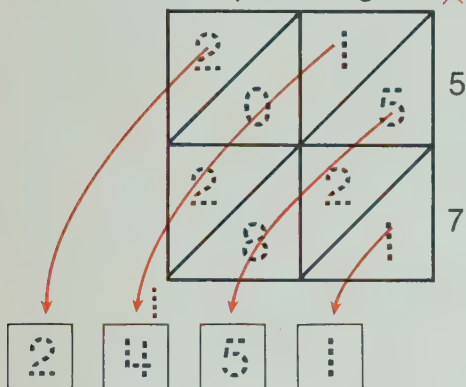
Left	Middle	Right
$\begin{array}{r} 97 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 97 \\ \times 26 \\ \hline \end{array}$	$\begin{array}{r} 97 \\ \times 6 \\ \hline \end{array}$

Try some more of your own.

● Special Multiplying

Study the example. Then find the products and write the completed multiplication problem.

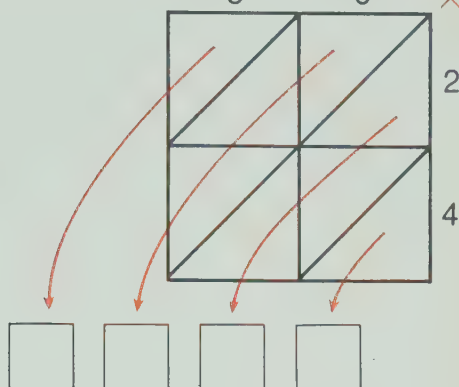
1. $\begin{array}{cc} 4 & 3 \\ \times & 57 \end{array}$



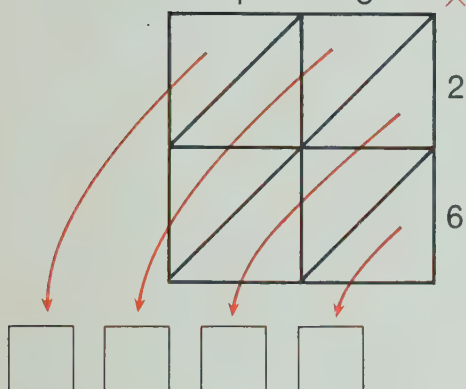
Problem:

$$\begin{array}{r} 43 \\ \times 57 \\ \hline 2451 \end{array}$$

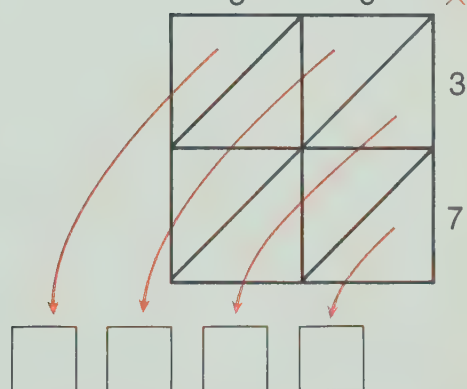
2. $\begin{array}{cc} 3 & 6 \\ \times & 24 \end{array}$ Problem:



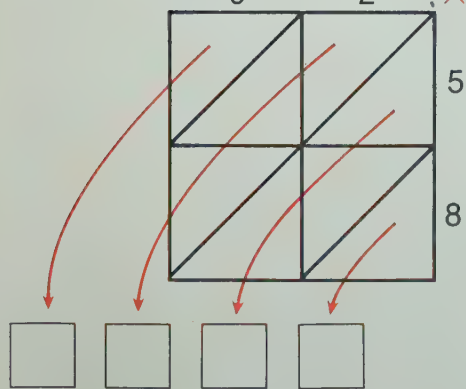
3. $\begin{array}{cc} 4 & 3 \\ \times & 26 \end{array}$



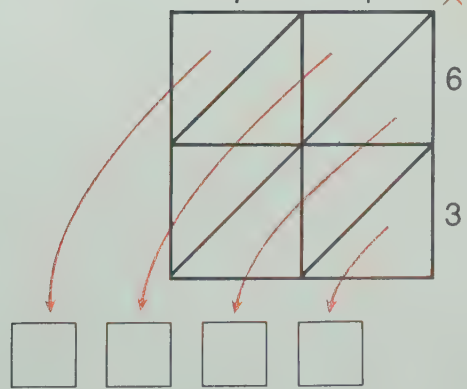
4. $\begin{array}{cc} 8 & 6 \\ \times & 37 \end{array}$



5. $\begin{array}{cc} 9 & 2 \\ \times & 58 \end{array}$



6. $\begin{array}{cc} 7 & 4 \\ \times & 63 \end{array}$



On a separate sheet of paper do 5 more of your own.

For each polygon connect the points in order:

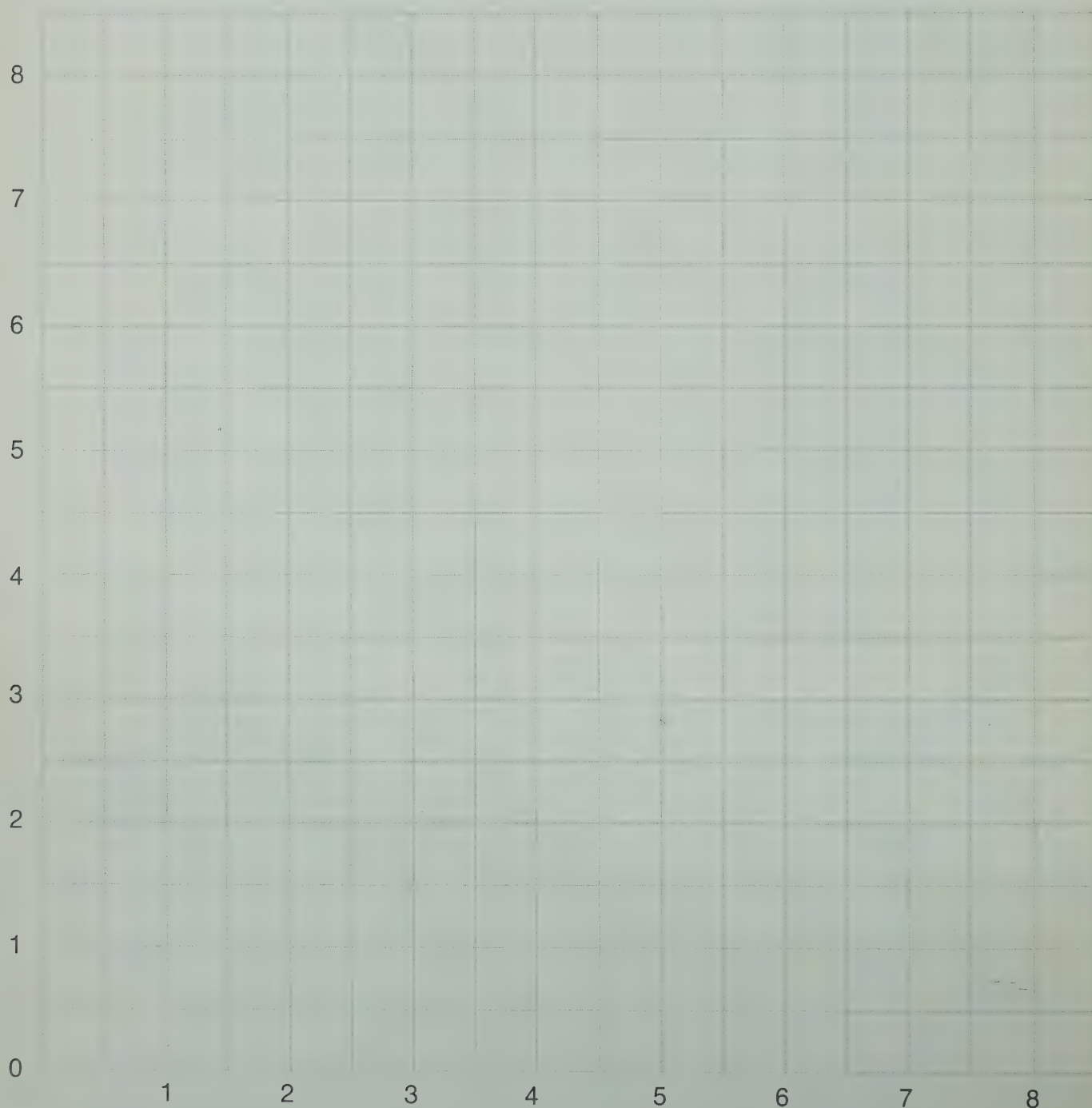
A square: $(6\frac{1}{2}, 1\frac{1}{2}), (7\frac{1}{2}, 2\frac{1}{2}), (8\frac{1}{2}, 1\frac{1}{2}), (7\frac{1}{2}, \frac{1}{2})$

A triangle: $(1, 1), (2\frac{1}{2}, 2), (6, \frac{1}{2})$

A pentagon: $(1, 7), (2\frac{1}{2}, 8), (4, 7), (3\frac{1}{4}, 5\frac{1}{2}), (1\frac{3}{4}, 5\frac{1}{2})$

A hexagon: $(4\frac{1}{2}, 7), (5\frac{1}{2}, 8), (7, 8), (8, 7), (7, 6), (5\frac{1}{2}, 6)$

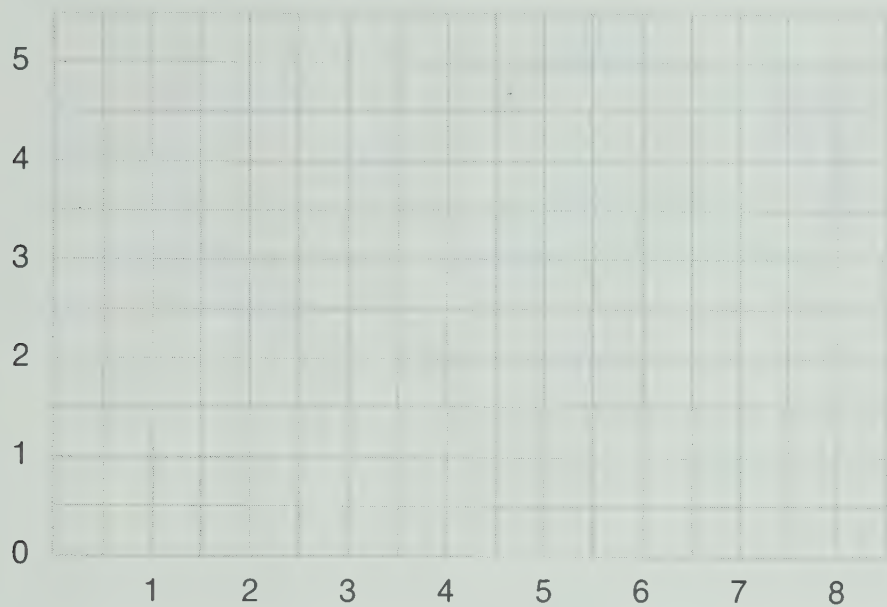
An octagon: $(3, 4\frac{1}{2}), (4, 5\frac{1}{2}), (5, 5\frac{1}{2}), (6, 4\frac{1}{2}), (6, 3\frac{1}{2}), (5, 2\frac{1}{2}), (4, 2\frac{1}{2}), (3, 3\frac{1}{2})$



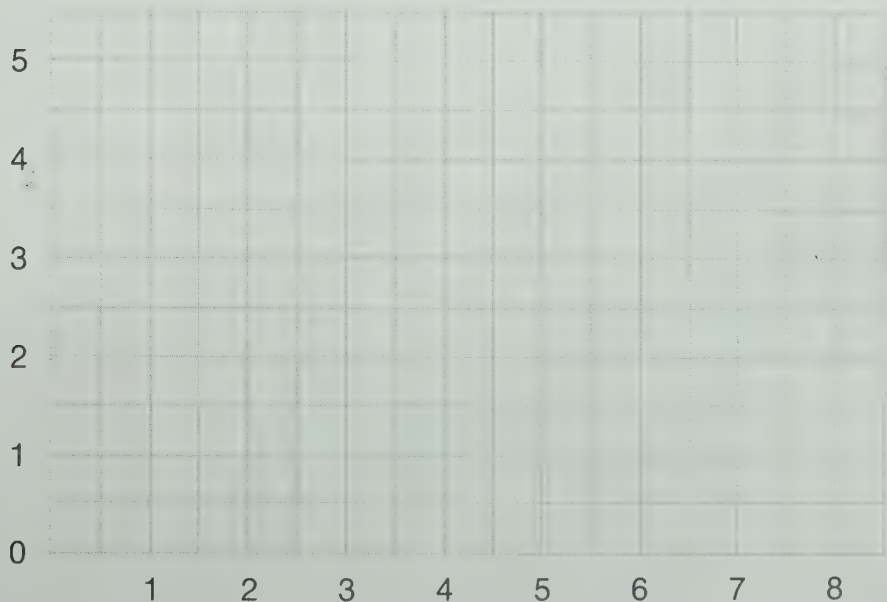
● Graphing and Creating Point Pictures

1. Graph this point picture by connecting these points in order:

$(\frac{1}{2}, 4\frac{1}{2})$, $(1, 1\frac{1}{2})$, $(2, 1)$, $(4, 2)$, $(5\frac{1}{2}, 1)$, $(7, 1\frac{1}{2})$, $(7, 2)$, $(7\frac{1}{4}, 3\frac{1}{2})$, $(7\frac{3}{4}, 3\frac{1}{2})$,
 $(8, 3)$, $(8, 2\frac{3}{4})$, $(7\frac{3}{4}, 2\frac{3}{4})$, $(7\frac{1}{2}, 3)$, $(7\frac{1}{2}, 1\frac{1}{2})$, $(7, 1)$, $(5\frac{1}{2}, \frac{1}{2})$, $(4, 1\frac{1}{2})$, $(2, \frac{1}{2})$,
 $(1, 1)$, $(\frac{1}{2}, 4\frac{1}{2})$.



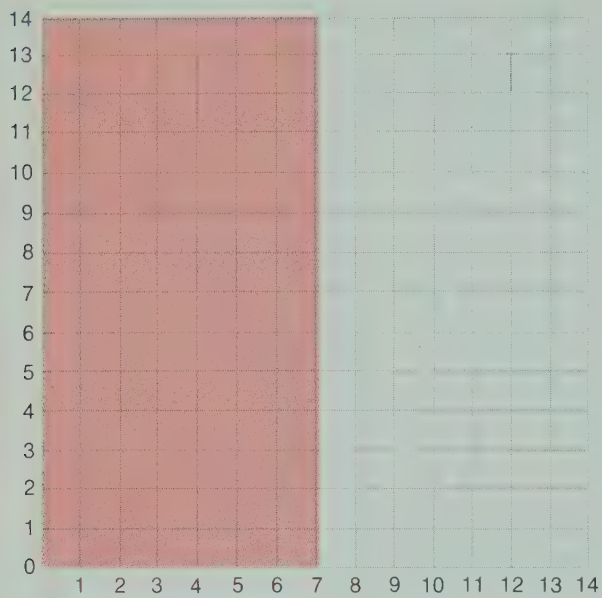
2. Make a point picture of your own and give the coordinates that someone could use to graph it. _____
- _____



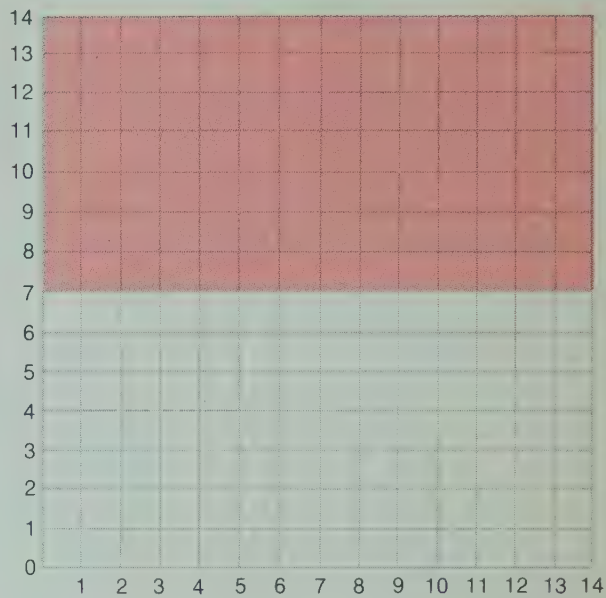
● Making Symmetrical Figures

Connect points to make half of a symmetrical figure on the shaded side of the line of symmetry. Give your figures to a classmate to complete.

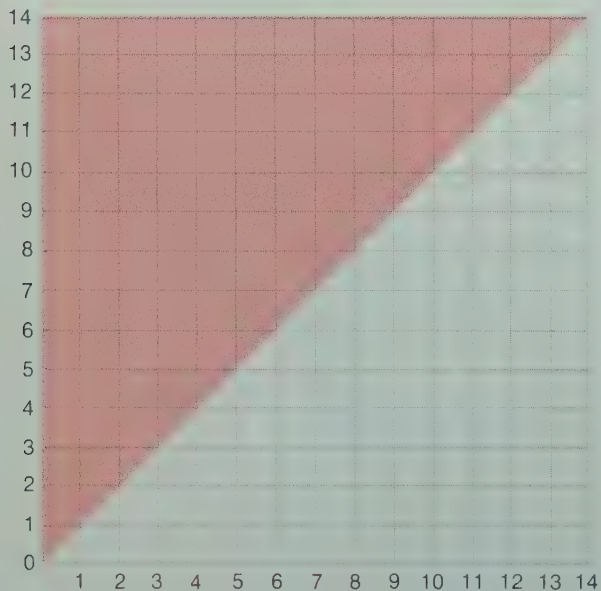
1.



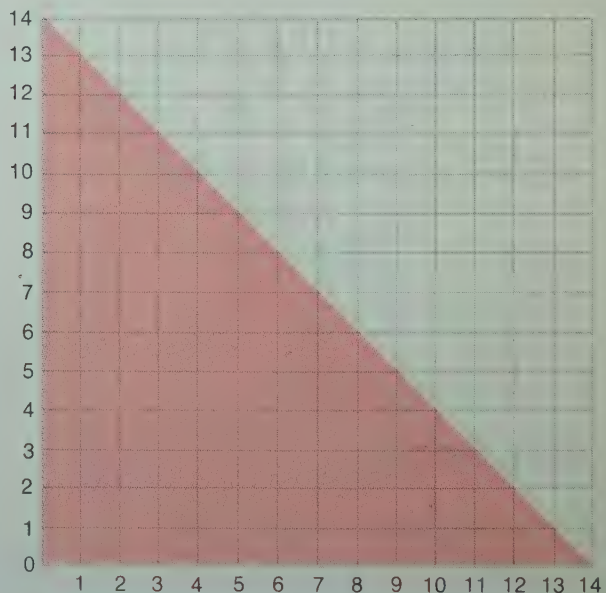
2.



3.

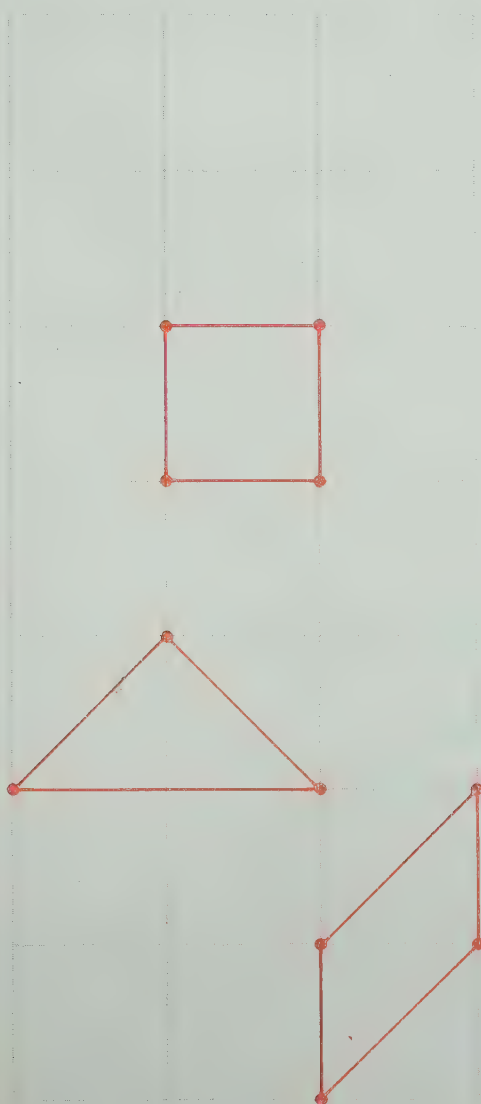
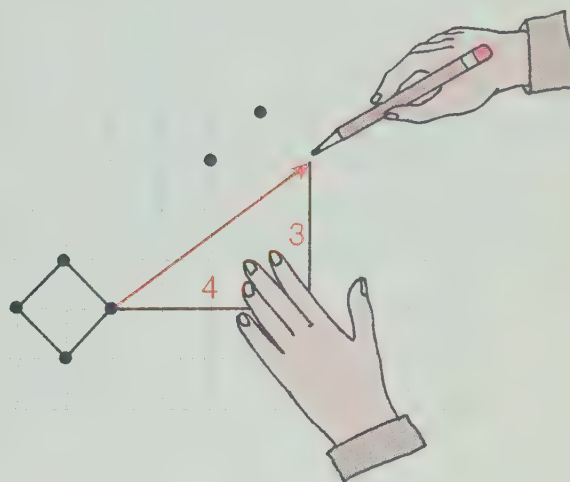
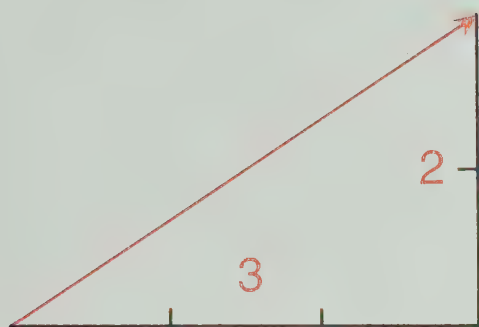


4.



● Using a Point Slider

The picture on the right shows an “over 4, up 3 **point slider**” being used to “move” the square to a new position. Trace the “over 3, up 2 **point slider**” on the left, cut it out, and use it to “move” each figure below to a new position.



● Graphing Functions

This function machine makes an input-output card each time it operates. Show at least 4 cards for each machine and graph the point for each card.

1.

THE FUNCTION MACHINE		
FUNCTION RULE		<input type="checkbox"/> <input type="checkbox"/>
Double and add 1		<input type="checkbox"/> <input type="checkbox"/>
INPUT	OUTPUT	<input type="checkbox"/> <input type="checkbox"/>
1	3	<input type="checkbox"/> <input type="checkbox"/>

input	output
(1,	3)

A

input	output
(2,	_____)

B

input	output
(3,	_____)

C

input	output
(4,	_____)

9
8
7
6
5
4
3
2
1
0

1 2 3 4 5 6 7 8 9

2.

THE FUNCTION MACHINE		
FUNCTION RULE		<input type="checkbox"/> <input type="checkbox"/>
Multiply the input by itself		<input type="checkbox"/> <input type="checkbox"/>
INPUT	OUTPUT	<input type="checkbox"/> <input type="checkbox"/>
1	1	<input type="checkbox"/> <input type="checkbox"/>

A

input	output
(0,	_____)

B

input	output
(1,	_____)

C

input	output
(2,	_____)

D

input	output
(3,	_____)

9
8
7
6
5
4
3
2
1
0

1 2 3 4 5 6 7 8 9

3.

THE FUNCTION MACHINE		
FUNCTION RULE		<input type="checkbox"/> <input type="checkbox"/>
Find half of the input and add 2		<input type="checkbox"/> <input type="checkbox"/>
INPUT	OUTPUT	<input type="checkbox"/> <input type="checkbox"/>
1	$2\frac{1}{2}$	<input type="checkbox"/> <input type="checkbox"/>

input	output
(1,	$2\frac{1}{2}$)

A

input	output
(2,	_____)

B

input	output
(3,	_____)

C

input	output
(4,	_____)

9
8
7
6
5
4
3
2
1
0

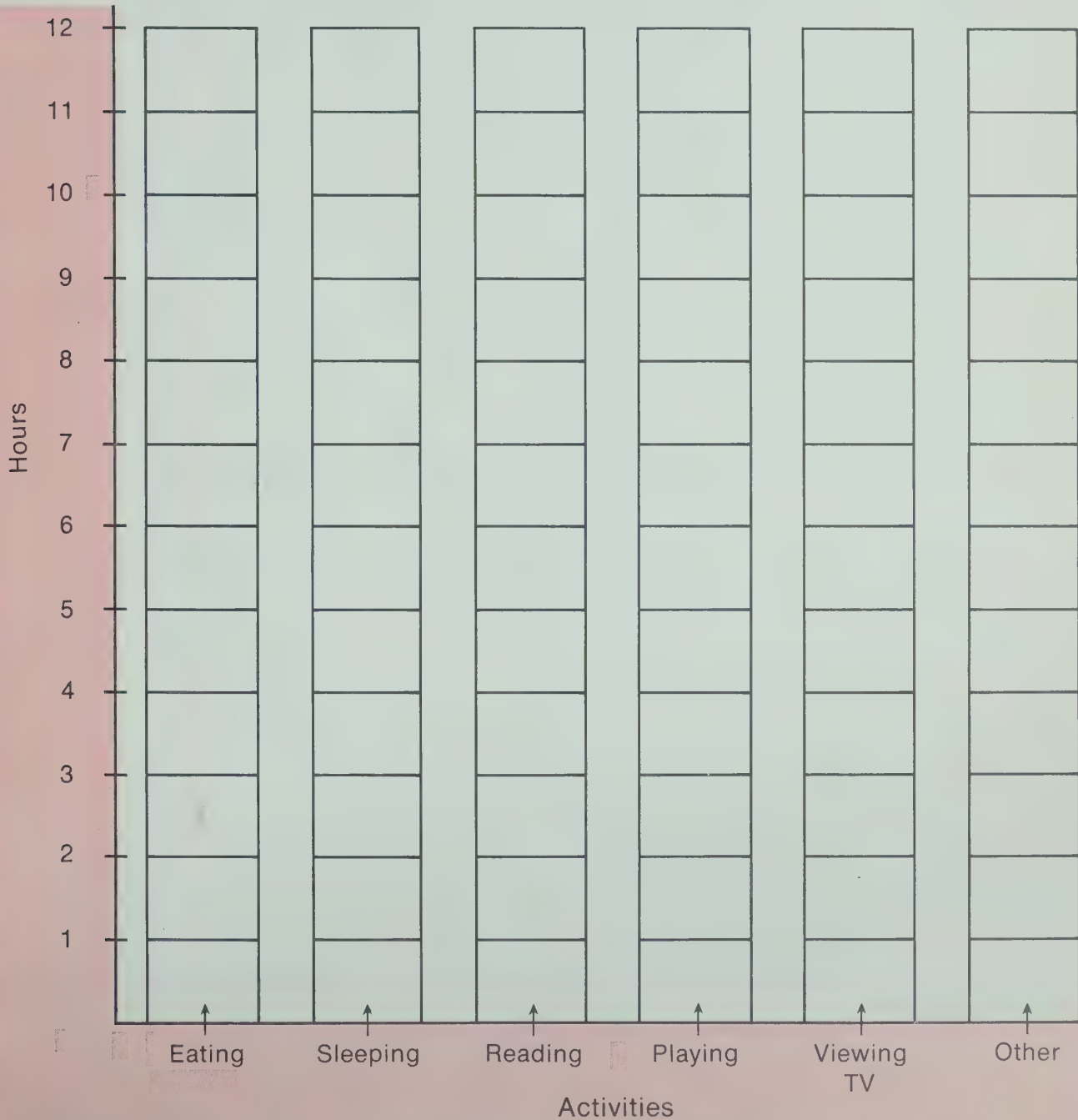
1 2 3 4 5 6 7 8 9

● Making a Bar Graph

Decide how much time you spend during a 24-hour day on each of the activities.

Then color a square or part of a square in the graph below for each hour or part of an hour you spend on each activity.

Your completed graph should show how you spend your time in an ordinary 24-hour day.

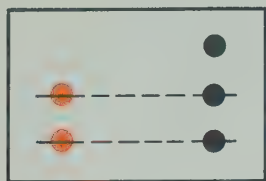


● Adding Negative Numbers

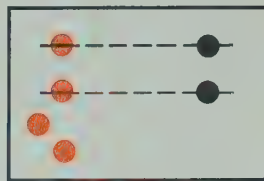
Use counters or checkers if you like. Think of the 2 colors as opposites. Mark out pairs of opposites and solve the equations.

EXAMPLES:

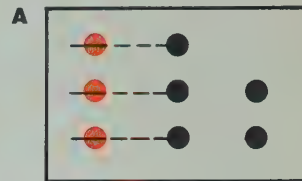
1.



$$-2 + 3 = \underline{\quad}$$



$$-4 + 2 = \underline{-2}$$



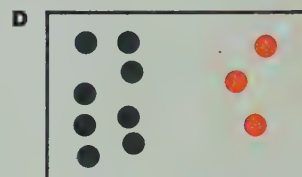
$$-3 + 5 = \underline{\quad}$$



$$-5 + 2 = \underline{\quad}$$



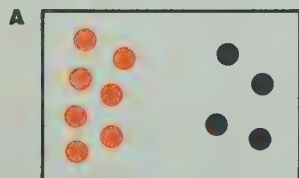
$$5 + -4 = \underline{\quad}$$



$$8 + -3 = \underline{\quad}$$

Write the Numbers

2.



$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$



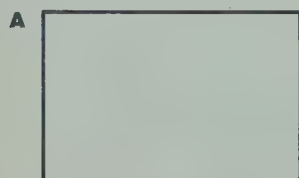
$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$



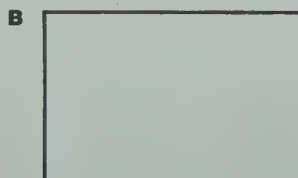
$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

Show the Dots

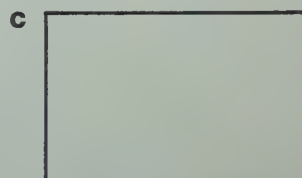
3.



$$7 + -2 = \underline{\quad}$$



$$-4 + 5 = \underline{\quad}$$



$$2 + -5 = \underline{\quad}$$

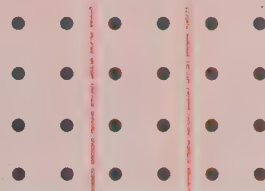
Write and solve some equations of your own.

How many different equations can you write about 24 dots?
 If you can, draw lines in each picture to show your thinking.
 Use $+$, $-$, \times , or \div . You may use combinations of these if you like.

EXAMPLES:



$$12 + 12 = 24$$

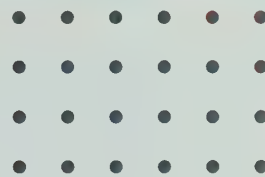


$$24 \div 3 = 8$$

1.



2.



3.



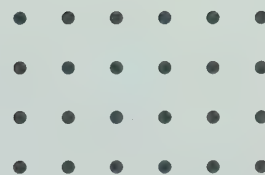
4.



5.



6.



7.



8.



9.



10.

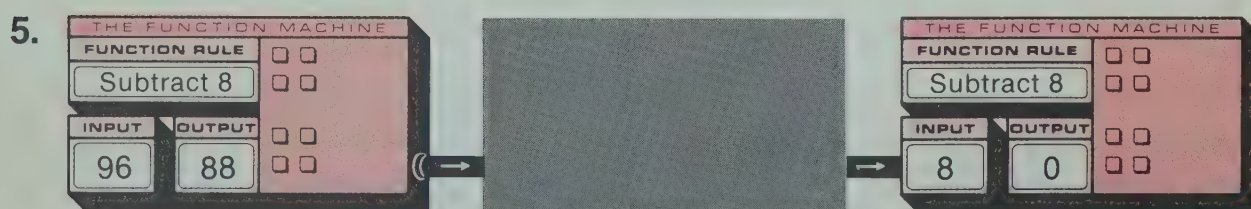
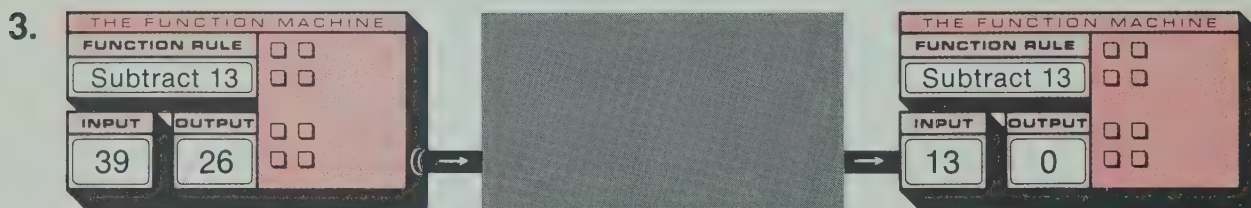
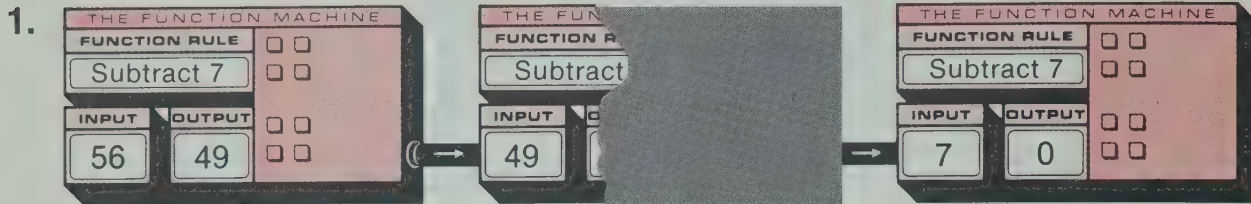


● The Function Machine

Each function machine in a row uses the same rule.

The machines are connected so that the output from a machine is the input of the next machine. How many machines are used in each row?

Total Number of Machines



● Dividing Larger Numbers

Study the example. Subtract the numbers indicated in each problem. Then complete the division equation.

1. $940 \div 4$

$$\begin{array}{r} 940 \\ - 800 \leftarrow (200) \text{ fours} \\ \hline 140 \\ - 120 \leftarrow (30) \text{ fours} \\ \hline 20 \\ - 20 \leftarrow (5) \text{ fours} \\ \hline 0 \end{array}$$

$940 \div 4 = \boxed{235}$

2. $1278 \div 3$

$$\begin{array}{r} 1278 \\ - 400 \leftarrow (400) \text{ threes} \\ \hline \\ - 20 \leftarrow (20) \text{ threes} \\ \hline \\ - 6 \leftarrow (6) \text{ threes} \\ \hline \end{array}$$

$1278 \div 3 = \boxed{}$

3. $3258 \div 9$

$$\begin{array}{r} 3258 \\ - 300 \leftarrow (300) \text{ nines} \\ \hline \\ - 60 \leftarrow (60) \text{ nines} \\ \hline \\ - 2 \leftarrow (2) \text{ nines} \\ \hline \end{array}$$

$3258 \div 9 = \boxed{}$

4. $3162 \div 6$

Use the largest possible of these numbers.

$$\begin{array}{r} 400 \\ - 500 \leftarrow \text{sixes} \\ \hline 600 \\ \downarrow \\ 10 \\ - 20 \leftarrow \text{sixes} \\ \hline 30 \\ \downarrow \\ 5 \\ - 6 \leftarrow \text{sixes} \\ \hline 7 \end{array}$$

$3162 \div 6 = \boxed{}$

5. $4536 \div 7$

Use the largest possible of these numbers.

$$\begin{array}{r} 400 \\ - 500 \leftarrow \text{sevens} \\ \hline 600 \\ \downarrow \\ 40 \\ - 50 \leftarrow \text{sevens} \\ \hline 60 \\ \downarrow \\ 7 \\ - 8 \leftarrow \text{sevens} \\ \hline 9 \end{array}$$

$4536 \div 7 = \boxed{}$

6. $1968 \div 8$

Choose the largest possible number for each

$$\begin{array}{r} 00 \leftarrow \text{eights} \\ \downarrow \\ 0 \leftarrow \text{eights} \\ \downarrow \\ \leftarrow \text{eights} \end{array}$$

$1968 \div 8 = \boxed{}$

●Creating Division Story Problems

Write a story problem for each picture.

You should be able to solve your problem by solving the equation.

1.



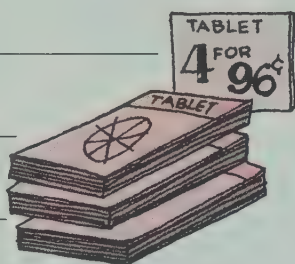
2.



$$144 \div 9 = \square$$

$$126 \div 6 = \square$$

3.



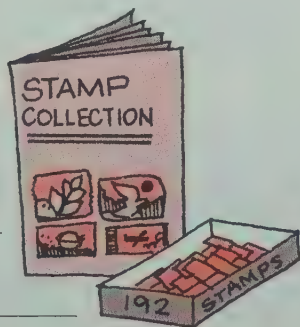
4.



$$96 \div 4 = \square$$

$$425 \div 5 = \square$$

5.



6. Make one of your own.



$$192 \div 8 = \square$$

$$\square \div \square = \square$$

● Number Tricks

Try these.

		↓ Your Choice	↓ Your Choice	↓ Your Choice
1. Choose a number	3			
Add 7	↓ 10			
Multiply by 2	↓ 20			
Subtract 4	↓ 16			
Divide by 2	↓ 8			
Subtract the number you chose	↓ 5			

What did you discover? _____

2. Use the signs $+$, $-$, \times , or \div to complete these equations.

A $(4 \quad 4) + (4 \quad 4) = 1$

B $4 \quad (4 \quad 4) = 4$

C $(4 \quad 4) + (4 \quad 4) = 2$

D $4 \quad 4 \quad 4 \quad 4 = 8$

E $(4 \quad 4 \quad 4) \quad 4 = 3$

F $4 \quad 4 \quad 4 \quad 4 = 16$

3. Use the signs $+$, $-$, \times , \div or $=$ to write equations in two different ways.

EXAMPLE: $8 \quad 5 \quad 3$
 $8 \quad 5 \quad 3$

answer: $8 = 5 + 3$

$8 - 5 = 3$

A $21 \quad 7 \quad 3$
 $21 \quad 7 \quad 3$

B $15 \quad 8 \quad 7$
 $15 \quad 8 \quad 7$

C $48 \quad 6 \quad 8$
 $48 \quad 6 \quad 8$

D $23 \quad 15 \quad 8$
 $23 \quad 15 \quad 8$

Other Ways to Find Quotients

Find quotients and . Then use these quotients to find quotient .

Check by multiplying.

1.
$$\begin{array}{r} 20 \\ 7 \overline{) 140} \end{array}$$

$$\begin{array}{r} 3 \\ 7 \overline{) 21} \end{array}$$

$$\begin{array}{r} 23 \\ 7 \overline{) 161} \end{array}$$

Check

$$\begin{array}{r} 23 \\ \times 7 \\ \hline 161 \end{array}$$

2.
$$\begin{array}{r} \\ 6 \overline{) 240} \end{array}$$

$$\begin{array}{r} \\ 6 \overline{) 12} \end{array}$$

$$\begin{array}{r} \\ 6 \overline{) 252} \end{array}$$

\times _____

3.
$$\begin{array}{r} \\ 4 \overline{) 360} \end{array}$$

$$\begin{array}{r} \\ 4 \overline{) 24} \end{array}$$

$$\begin{array}{r} \\ 4 \overline{) 384} \end{array}$$

\times _____

4.
$$\begin{array}{r} \\ 3 \overline{) 240} \end{array}$$

$$\begin{array}{r} \\ 3 \overline{) 18} \end{array}$$

$$\begin{array}{r} \\ 3 \overline{) 258} \end{array}$$

\times _____

5.
$$\begin{array}{r} \\ 9 \overline{) 450} \end{array}$$

$$\begin{array}{r} \\ 9 \overline{) 27} \end{array}$$

$$\begin{array}{r} \\ 9 \overline{) 477} \end{array}$$

\times _____

6.
$$\begin{array}{r} \\ 8 \overline{) 480} \end{array}$$

$$\begin{array}{r} \\ 8 \overline{) 16} \end{array}$$

$$\begin{array}{r} \\ 8 \overline{) 496} \end{array}$$

\times _____

7.
$$\begin{array}{r} \\ 5 \overline{) 350} \end{array}$$

$$\begin{array}{r} \\ 5 \overline{) 35} \end{array}$$

$$\begin{array}{r} \\ 5 \overline{) 385} \end{array}$$

\times _____

● Story Problems and Equations

Match each story problem with an equation then solve the equation and the problem.

1. A butterfly lived longer than butterflies usually do. It lived 84 days. How many weeks

is this? _____

A $8 + \underline{\hspace{1cm}} = 584$

B $8 \times 584 = \underline{\hspace{1cm}}$

C $584 - 8 = \underline{\hspace{1cm}}$

2. There are 584 children in Washington School. On a certain day 8 were absent. How many children were at

school? _____

D $84 \div 7 = \underline{\hspace{1cm}}$

E $584 \div 8 = \underline{\hspace{1cm}}$

3. There 584 children at Milltown. Only 8 have registered for school. How many have not yet

registered? _____

Work Space

4. You can put 8 softballs in a box. How many boxes will you need

to hold 584 softballs? _____

5. If one worker earns 8 dollars an hour, how much will a factory owner have to pay 584 of these workers to work one

hour? _____

● Dividing and Remainders

When is the remainder 0?

1. Check  the numbers which give a remainder of 0 when you divide by 2.

$$\begin{array}{r} 20 \\ 2 \overline{)40} \\ \underline{40} \\ 0 \end{array}$$

B $2 \overline{)41}$

C $2 \overline{)42}$

D $2 \overline{)43}$

E $2 \overline{)44}$

F $2 \overline{)45}$

G $2 \overline{)46}$

H $2 \overline{)47}$

D $2 \overline{)48}$

E $2 \overline{)49}$

When dividing by 2,

The remainder will be 0 if the number ends in

0, , , or

2. Try some quotients. Then complete the following:

A When dividing by 10, the remainder will be 0 if the number ends

in _____

B When dividing by 5, the remainder will be 0 if the number ends

in _____

● Sets of Marbles

How many marbles in each bag if each bag has the same number?
Write the number on each bag.

1.



gives

Total
Number

48 marbles

2.



gives

17 marbles

3.



when
doubled
gives

32 marbles

4.



when
doubled
gives

28 marbles

5.



when divided
in half
gives

18 marbles

6.



when
tripled
gives

24 marbles

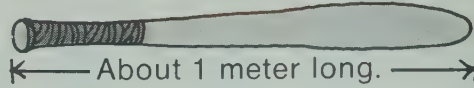
A **centimeter** unit is about this long.



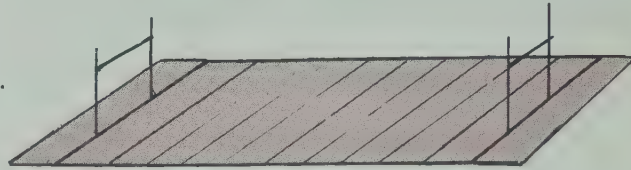
A **millimeter** unit is a tiny unit.

10 millimeters are as long as 1 centimeter.

A **meter** unit is 100 centimeters long.
It is about as long as a baseball bat.



A **kilometer** unit is 1000 meters long.
10 football fields placed end to end
are about 1 kilometer long.

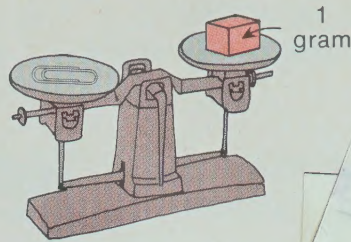


Write the name of the unit which would best be used to measure the following distances.

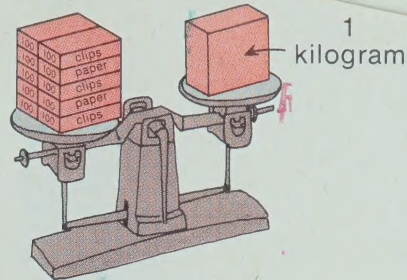
1. The length of your book _____
2. The distance from New York
to San Francisco _____
3. The thickness of the cover
of your book _____
4. The height of a person _____
5. The height of a building _____
6. The width of your desk _____
7. The width of your state _____
8. The width of the lead in
your lead pencil _____

● Which Unit of Weight Would You Use?

A paper clip weighs about 1 **gram**.



1000 paper clips weigh about 1 **kilogram**.



An 8 or 9 year old child might weigh about 30 **kilograms**.

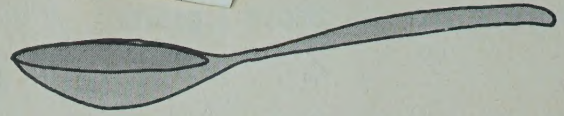
Something that weighs 1 gram (a paper clip, for example) weighs 1000 **milligrams**. A **milligram** is a tiny unit of weight.

Write the name of the unit above which would best be used in weighing the following:

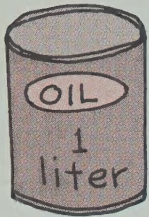
1. The weight of a cow _____
2. The weight of a box of cereal _____
3. The weight of an airplane _____
4. The weight of a hair on the leg of a housefly _____
5. The weight of a nickel _____
6. The weight of a grain of sand _____
7. The weight of a golf ball _____
8. The weight of a bowling ball _____

● Which Unit of Capacity was

A **milliliter** is a small unit of capacity.
A teaspoon holds about 5 **milliliters** of liquid.



A **liter** is a unit 1000 times as much as a milliliter. Four large cups hold almost 1 **liter** of liquid.



A **kiloliter** is as much as 1000 liters. It is a large unit of capacity.

Write the name of the unit above which would best be used in giving these capacities.

1. The amount of medicine in a small medicine bottle _____
2. The amount of soda pop in an average bottle _____
3. The amount of water in the Atlantic Ocean _____
4. The amount of gasoline in an automobile tank. _____
5. The amount of gasoline used in the world last year _____
6. The amount of chemical in a 10-centimeter long test tube _____
7. The amount of liquid you drink in a day _____



000028386522

Consumable
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